Ministry of Universities,
Science and Communications

Annual Report 1981–82

BC

British Columbia. Ministry of Universities
Science and Communications
Annual report. — 1980/81 —

Continues in part: British Columbia. Ministry of Education, Science and Technology. Annual report. ISSN 0711-9151; and, British Columbia. Ministry of Transportation, Communications and Highways. Report. ISSN 0708-7691
ISSN 0711-9429 = Annual report - Ministry of Universities, Science and Communications

1. British Columbia. Ministry of Universities, Science and Communications. 2. Education, Higher - British Columbia - Periodicals. 3. Science and state - British Columbia - Periodicals. 4. Telecommunication policy - British Columbia - Periodicals.

L222.B7A24 354-71106851

October 4, 1982

The Honourable Henry P. Bell-Irving, D.S.O., O.B.E., E.D.
Lieutenant-Governor of British Columbia

MAY IT PLEASE YOUR HONOUR:

Herewith, I respectfully submit the Annual Report of the Ministry of Universities, Science and Communications for the year ended March 31, 1982.

Yours truly

Patrick L. McGeer
MINISTER

October 4, 1982

The Honourable Patrick L. McGeer
Minister of Universities, Science and Communications
Parliament Buildings
Victoria, B.C.

Sir:

I have the honour to submit the Annual Report of the Ministry of Universities, Science and Communications for the year ended March 31, 1982.

Yours truly

Robert W. Stewart
DEPUTY MINISTER

TABLE OF CONTENTS

MINISTER'S MESSAGE 4

DEPUTY MINISTER'S MESSAGE 6

MINISTRY ADMINISTRATION DIVISION 7

Executive of the Ministry

Finance and Administration Branch

SCIENCE AND TECHNOLOGY DIVISION 9

Research Projects

SCIENCE COUNCIL OF BRITISH COLUMBIA 11

Role and Functions

Research and Development Policy

Awards

Secretariat on Science, Research and Development

Other Activities

SCIENCE GRANTS PROGRAM 15

Research Competition Number Four (RC4)

Research Competition Number Five (RC5)

BRITISH COLUMBIA RESEARCH COUNCIL 16

Role and Functions

Projects and Achievements

DISCOVERY FOUNDATION 20

Role and Functions

Projects and Achievements

The Future

COMMUNICATIONS DIVISION 22

TELECOMMUNICATIONS SERVICES BRANCH 22

Role and Functions

Projects and Achievements

The Future

COMMUNICATIONS DEVELOPMENT BRANCH 25

Role and Functions

Projects and Achievements

The Future

METRIC CONVERSION AND STANDARDS INFORMATION OFFICE 31

Role and Functions

Projects and Achievements

The Future

UNIVERSITIES DIVISION 33

THE UNIVERSITIES COUNCIL 34

Role and Functions

OPERATING GRANTS 38

OPERATING GRANTS (OTHER) 38

GRANTS – CAPITAL SUPPORT PROGRAMS 42

STUDENT AID PROGRAMS 43

British Columbia Student Assistance Program

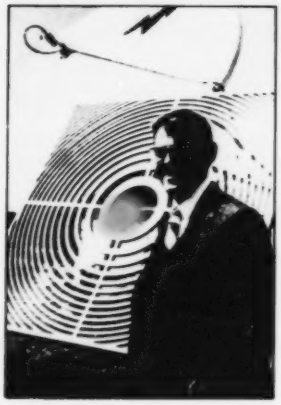
The Work-Study Program

LIST OF PERSONNEL 46

ORGANIZATIONAL CHART 47

MINISTER'S MESSAGE

Dr Patrick L. McGeer, Minister of Universities, Science and Communications, standing before the Zone Plate Antenna, a new plywood antenna developed by ministry staff for receiving television signals from satellites.



This year's annual report demonstrates continued dynamic activity in the Ministry of Universities, Science and Communications.

During this fiscal year, the public universities of British Columbia continued to be amongst the most favoured in the nation with further generous increases in operating and capital funds. This reflects the commitment of the government to our most valuable asset—our coming generation of social, professional and industrial leaders. Special funds were made available to the medical school at the University of British Columbia to permit a greater number of young British Columbians to enter the medical profession. Over 70 per cent of the new physicians in British Columbia come from outside the province, leaving British Columbia students the most disadvantaged in the nation in terms of medical opportunities even with enlargement of the medical class. Efforts are also being made to provide additional opportunities for professional and technical training in fields such as engineering where a lack of educational opportunities is evident.

In the area of science, the ministry continued to give active support to the Discovery Foundation, the Science Council of British Columbia, the B.C. Research Council, and to special projects such as alternative fuel development. The ministry, along with the Energy Development Agency, and the Ministry of Energy, Mines and Petroleum Resources sponsored a world conference entitled "Methane: Fuel for the Future". This resulted in the publication of a book by Plenum Press of New York which has received a favourable review in the prestigious magazine "Science". A new magazine "BC Discovery" was launched by the ministry with world-wide distribution. It tells the story of scientific accomplishment by British Columbia's academic and industrial leaders.

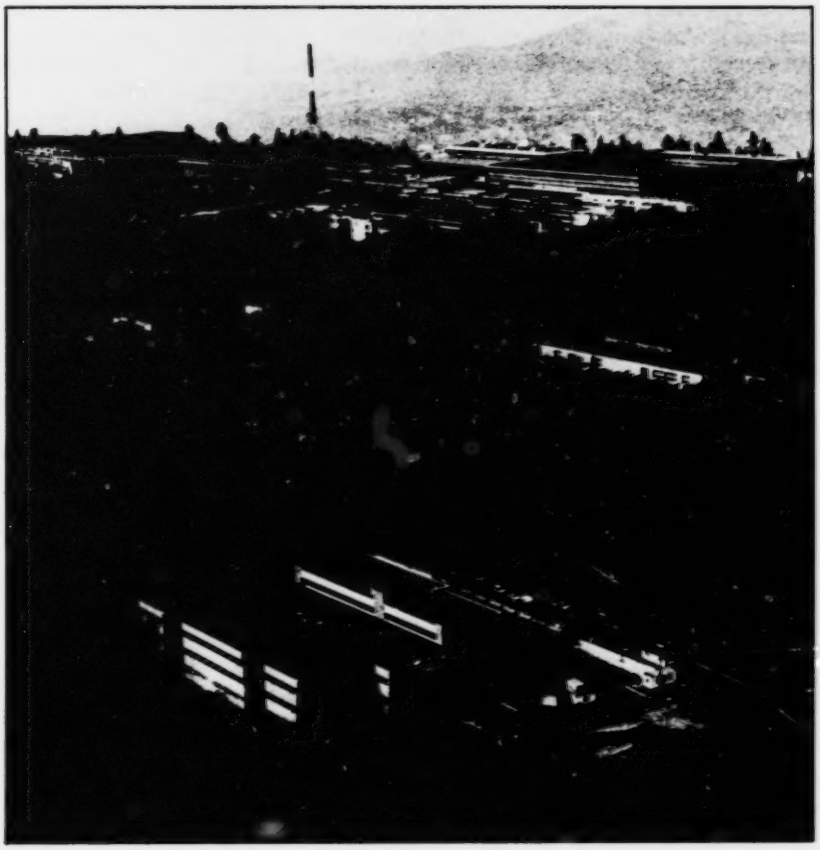
The vast and mountainous terrain of B.C. and the natural isolation of many citizens requires advanced communications policy. That is the reason why government pursues an "open skies" policy and why it has introduced the Knowledge Network and grants to support satellite reception in remote communities.

The marked increase in enrollments in both credit and non-credit courses via tele-education, particularly in the regions outside the Lower Mainland, is evidence of the public acceptance of this program.

Another area of communications policy is beginning to bear fruit. British Columbia has adopted a position which favours competition in the furnishing of telecommunications, both in terminal equipment and in transmission links. As a result, there is growing in this province a flourishing "interconnect" industry which did not exist before, complementing, and thereby supporting, a healthy, local electronics manufacturing industry.

During this past year, moves have been made by the Communications Division to place the telecommunications system of the B.C. government at the cutting edge of modern technology. Commitments were made for new switching and trunking systems which will permit analogue and digital communication throughout the provincial government network, with provision for satellite interconnection in the future. These advanced switching systems will pave the way for installation of equipment of the "office of the future", with a consequent increase in the speed and efficiency of service to the public. This overhaul of the government telecommunications system is in line with the general policy of the Government of British Columbia of giving British Columbians every opportunity to benefit from modern technology.

In terms of the number of public servants employed, the ministry is small. Those who serve the ministry are measured by their performance, and not by the size of the group. Their accomplishments have been big ones, and I am proud of each and every one of them for their achievement in service to the people of our province.



The $9 million research facility owned by Microtel Pacific Research is the first major research facility to be completed in the 34 hectare Discovery Park at Simon Fraser University.

DEPUTY MINISTER'S MESSAGE

This annual report features an unusually complete discussion of the Science and Technology Division of the ministry. The division is responsible for operating the British Columbia government's science system which has been put in place by the ministry and its predecessor over the last four years. The system, comprised of BC Research, the Science Council and Research Secretariat, the Discovery Foundation and Discovery Parks Incorporated, and the Internal Research Advisory Committee, is perhaps the most comprehensive in the country and has been examined with interest, and sometimes by emulation, by other jurisdictions. Incredibly, in this day when civil services are constantly accused of accumulating Parkinsonian fat, it operates with only two civil servants: the Director of the Science and Technology Division and his secretary. The system has now become an established part of the scientific and technological life of the province, and makes its presence felt within government, the educational institutions and the private sector.

Another new initiative came to fruition. The Knowledge Network started its full programming activities at the beginning of 1982. It has received almost instant recognition for the quality of its programming and for the many innovative ideas which have been applied.

In the Communications Division, there has been continued activity in trying to advance the province's view that there should be a relaxation of regulation, and more provincial responsibility for such regulation as remains. At the same time work has progressed in designing and developing a new government communications system to fully modern standards.

In the Universities Division, the principal new activity has been in setting up a more comprehensive planning system for capital acquisitions. The delicate task of making the government's views known to the independent institutions, and vice versa, has been continued and there are indications of better understanding on both sides.

The Metric Division has expanded its standards activity, and continued its task of informing the public and industry of new developments in metrication. Careful preparatory work has permitted conversion to proceed more smoothly than in some other jurisdictions.

The Administration Division, working with all other divisions, has been heavily involved in adapting and making function the new and more elaborate systems being put in place by the Ministry of Finance.

All in all it was a productive year, overshadowed by the looming clouds of the economic downturn and restraint which present a new range of problems and challenges.

Dr Robert W. Stewart, Deputy Minister of Universities, Science and Communications.

MINISTRY ADMINISTRATION DIVISION

Ministry Administration is composed of the Finance and Administration Branch, consisting of the Financial Management Services Section and the Personnel Services Section, the Executive of the Ministry, their secretaries, 16 support staff, and consultants required for special research projects.

EXECUTIVE OF THE MINISTRY

The Executive of the Ministry is responsible for ensuring that the ministry's policies, priorities, and program content, determined by the government, are properly administered. Five senior and middle management staff members report directly to the office of the deputy minister.

FINANCE AND ADMINISTRATION BRANCH

The Finance and Administration Branch combines the functions of personnel, systems development, ministry space requirements, financial management and accounting.

Personnel Services Section

Personnel services are provided to each branch of the ministry by a personnel technician, under the supervision of the Director of Finance and Administration. The personnel office is responsible for providing technical advice and consultation for recruitment and selection of staff, contract negotiations, and administration, application and maintenance of classification systems, occupational health services, and safety programs. In providing support to the ministry, the personnel office confers with the Public Service Commission, and the Government Employee Relations Bureau.

Financial Management Services Section

Financial Management is responsible for all financial accounting and fiscal controls within the ministry. This responsibility includes providing financial services, co-ordinating the preparation of the budget, and preparing financial management reports. The section is also responsible for providing office accommodations and co-ordinating with BC Systems Corporation in supplying the ministry's computer needs.

Accounting responsibilities include preparation of the payroll, processing the ministry's expenditure and revenue, and maintaining and updating the Accounting Policy and Procedures Manual.

Objectives

The 1982-83 objectives of the Finance and Administration Branch are to:

- complete a ministry budgeting manual;
- acquire additional qualified accounting staff in order to better address the requirements of the Financial Administration Act;
- update and improve the existing accounting Policies and Procedures Manual;

- implement specific financial control policies initiated by the Comptroller-General and Treasury Board; and
- develop an information services section to co-ordinate the ministry's public information endeavours.

Gross Expenditures,
Comparison of Fiscal Years 1980-81 and 1981-82

Year	Amount
1981-82	$356 573 533
1980-81	$296 106 151

Summary of Expenditures Related to Estimates

Description of Vote	1981-82 Estimates	1981-82 Actual Expenditure
Minister's Office	$ 147 400	$ 146 413
Ministry Administration	1 154 371	979 230
Universities	323 865 928	322 230 074
Metric Conversion	286 335	257 652
Science and Technology	8 260 524	8 260 524
Telecommunications Services	22 938 029	22 698 070
Communications Systems Dev. and Reg.	2 315 883	1 569 250
Building Occupancy	391 000	310 121
Computer and Consulting	122 200	122 199
	$359 481 670	**$356 573 533**

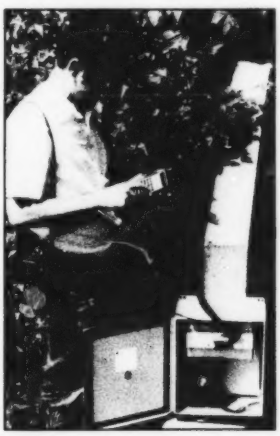
SCIENCE AND TECHNOLOGY DIVISION

Through the Science and Technology Division of the ministry, the growth of scientific and technology based industries in British Columbia is supported with the active participation of members of the academic community and the industrial sector. The ministry's support system recognizes that one objective of the Government of British Columbia is to provide an environment — both physical and intellectual — in which scientific research can flourish, and where environmentally clean, high technology industrial research can take place.

The ministry encourages the development of science and technology within the province, and conducts the greater part of its work through the following organizations:

- The Science Council of British Columbia;
- The Secretariat on Science, Research and Development;
- The Discovery Foundation and its wholly-owned subsidiary, Discovery Parks Incorporated; and
- The British Columbia Research Council and its technical operating component, BC Research.

One of the aims of the science system is to bring advanced technology to the marketplace. Development of this system for measuring water levels was one of the projects funded by the Science Council. It is now being commercially manufactured and marketed.



The Science Council of British Columbia, supported by the Secretariat on Science, Research and Development, provides advice to government on priorities for research and development. Through the Science Council, the ministry allocates funds for the support of applied research and development projects, Graduate Research Engineering and Technology (GREAT) Awards, and Industrial Post-Doctoral Fellowships.

The Discovery Foundation, and its wholly-owned subsidiary, Discovery Parks Incorporated, have been established to advance scientific, technological, and industrial research in British Columbia through the establishment of industrial research parks, which provide an opportunity for the industrial sector to work with the academic community in the development of high technology and knowledge-based industry within the province. The British Columbia Research Council, a non-profit research organization funded in part by the ministry, provides a further opportunity for the industrial sector to obtain assistance. BC Research undertakes both contract research and government-funded research on immediate problems of concern to the whole province. In addition to the focus on scientific inquiry and technological development within the province, maintained through the combined activities of these organizations, the Internal Research Advisory Committee has been established to maintain an awareness of the type of ongoing research and development required by government.

The Science and Technology Division also provides general staff support for the ministry. The division:

- develops, co-ordinates, directs, and assesses programs;
- undertakes research and makes recommendations regarding research program proposals and program alternatives;

- represents the ministry on committees and working groups dealing with scientific and technological research activities;
- maintains a continuous review of research activities; and
- ensures the flow of information for management.

As well as providing staff support for the ministry, assistance is provided to persons and organizations seeking information and direction concerning scientific research and development activities or opportunities within the province.

RESEARCH PROJECTS

Through the Science and Technology Division, the ministry initiates and promotes special projects involving scientific research and technological development.

Compressed Natural Gas (CNG) as a Transportation Fuel

Further to its initial efforts in 1980-81 to support and fund demonstration projects and scientific studies on the use of CNG as a vehicle fuel, the ministry continued to promote the establishment of a major CNG research and development program in Canada. This effort was brought to fruition by an announcement last fall that the federal government would provide $6 million over five years in support of such a program in British Columbia. Under this new funding arrangement, BC Research and the University of British Columbia will continue to undertake research and development work on CNG as an alternate vehicle fuel. On January 22, 1982, the federal government announced an incentive grant of $600 per conversion for public and fleet vehicle owners wishing to convert their vehicles to CNG. The provincial government intends to match the federal incentive with a grant of $200 per conversion, and the removal of the provincial fuel tax on CNG.

Through its membership in the Energy Development Agency, the ministry has supported and promoted several other programs concerned with the use of CNG as a vehicle fuel. Through funding approved by the Energy Development Agency, the promotional program on CNG, initiated last year by the ministry, was continued through 1981-82. As a result of this program, several companies are now converting their commercial vehicles to use CNG as a dual fuel with gasoline.

Recently, the Energy Development Agency announced funding for a CNG training program to be located at the Pacific Vocational Institute in Vancouver. It is expected that this program will train a sufficient number of mechanics to provide for the conversion to CNG of many more vehicles over the next few years.

The ministry took a further initiative in September 1981 in sponsoring, in Vancouver, an International Conference on Methane entitled Fuel for the Future. The purpose of this conference, attended by representatives from companies and governments around the world, was to focus on an international strategy for using CNG as a transportation fuel. The success of this conference was demonstrated by the enthusiasm and support provided from both the private and public sectors.

At a more technical level, demonstration studies undertaken at BC Research during the past year have shown the relative advantages of using CNG as an alternate fuel to gasoline. Eighteen vehicles converted to CNG as a dual fuel with gasoline have been tested on both fuels, and the

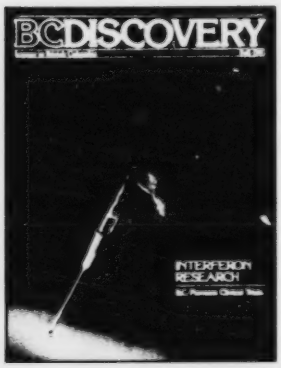
results indicate that CNG has as high, and in some cases, a higher efficiency and power output than gasoline over a range of performance testing levels. With minor adjustments to the ignition system, and the adaptation of specially designed conversion kits, CNG has proven to be a superior fuel, from the point of view of both economics and maintenance.

BC Research, acting on behalf of the ministry, has also continued its efforts to ensure the establishment and development of appropriate safety standards and regulations. Currently, national standards CGA 12.3 and CAN 1B-149.2 M80 provide uniform standards across Canada to ensure that vehicles equipped to run on CNG are safe.

The Alternate Fuels Laboratory in the Department of Mechanical Engineering at UBC has completed the first phase of its work on testing CNG. Technical reports now available indicate several ways in which automotive engines can be mechanically adapted to use CNG more effectively and efficiently.

In February of this year, the ministry made a submission — The Supply and Surplus of Natural Gas and Natural Gas Liquids — to the Commissioner Inquiry on British Columbia's Requirements. In its submission, the ministry projected that, by 1985, over 50 000 private passenger vehicles, in addition to various other fleet vehicles, will be converted to use CNG. It is anticipated that, by the year 2000, over 300 000 private passenger vehicles will be operating on CNG. The result of these projections, and the additional conversion of other fleet vehicles such as taxis, buses, and trucks, could require the consumption of over 11 billion cubic metres of CNG by the year 2000. This would represent a significant part of the province's anticipated gasoline requirement for transportation fuel, and a considerable reduction in Canada's dependence on imported oil.

First issue of BC Discovery, a magazine designed to provide information on research and development activities in the province.



Promotion of Scientific Activities

In October 1981, the ministry sponsored the Discovery Fair, a display and exposition of high technology research and development held at the Robson Square Media Centre in Vancouver. The theme of the fair was communication and automation. Over 27 companies and organizations displayed the latest in technological advances and the application of scientific research in industrial innovation and commercial development. Over 30 000 visitors attended the 10-day fair.

The BC Discovery magazine was published this year to provide information to the public and the scientific community on research and development activities in the province. Feature articles focussed on the development and application of the semi-conductor material gallium arsenide (GaAs) – used as a replacement for silicon in the manufacture of electronic chips – and the development of interferon as a weapon against cancer. Many more scientific and innovative industrial activities in the province will be described in future editions of the magazine.

SCIENCE COUNCIL OF BRITISH COLUMBIA

The Science Council of British Columbia, and the Secretariat on Science, Research and Development were established in June 1978 under the Science Council of British Columbia Act. The council and secretariat report to the Minister of Universities, Science and

Communications. Details of council activities may be found in the Science Council's annual report.

The following are members of the Science Council of BC:

Chairman: R.W. KEYES, Consulting Economist;

J.F. COCHRAN, Dean of Science, Simon Fraser University;

D.H. COPP, Department of Physiology, University of British Columbia;

H.M. ELLIS, Director of Research and Development, BC Hydro and Power Authority;

O.L. FORGACS, Vice-president of Research, MacMillan Bloedel Ltd.;

J.C. MADDEN, President, Microtel Pacific Research Ltd.;

R.D. MALCOLM, Barrister and Solicitor, Ladner Downs;

V.A. MODE, Executive Director, BC Research;

J.D. MURDOCK, President, Chemetics International Ltd.;

R.A. NODWELL, Head, Department of Physics, University of British Columbia;

T.W. PEARSON, Department of Biochemistry & Microbiology, University of Victoria;

S.C. ROONEY, President, Durand Machinery Company Ltd.;

P.C. TRUSSELL, Chairman, Forest Research Council;

L.M. WEDEPOHL, Dean of Applied Science, University of British Columbia;

H.M. WRIGHT, Chairman, Wright Engineers Ltd.

W.M. ARMSTRONG, retired, Honourary member and special advisor.

The following attend meetings, but are not members:

M.A. CAIRNS, Associate Director, Secretariat on Science, Research and Development;

J.T. SAMPLE, Executive Director, Secretariat on Science, Research and Development;

R.W. STEWART, Chairman of IRAC, Deputy Minister of Universities, Science and Communications.

The council's members are researchers, research managers, business executives, and senior administrators from both the academic and business sectors, who provide their services on a voluntary basis.

ROLE AND FUNCTIONS

The principal duties of council, as described in the Science Council Act, are to:

- consider all matters brought to its attention by the minister and, where required by the minister, report its findings to him;
- formulate recommendations respecting the acqulsition, development, and dissemination of scientific, technological, and scholarly knowledge to promote the industrial, economic, and social development of the province;
- advise the government on implementation of science policy;
- gather and organize information on scientific research;
- facilitate discussions on science policy with the Government of Canada or a province or with an interested person;
- recommend the establishment and awarding of fellowships, scholarships, exhibitions, bursaries, grants, and prizes to encourage development of improved technology and retention of skilled research personnel in the province; and

- evaluate research and development proposals submitted to the council by the secretariat, and make recommendations to the government respecting the funding of these proposals.

RESEARCH AND DEVELOPMENT POLICY

The objectives of the council's research and development policy for British Columbia are to:

- consolidate and expand employment and productivity of existing industries by establishing, maintaining, and improving their competitive position – especially in export markets – with particular attention to the maintenance of long-term productivity of the province's forests, mines, agricultural lands, and waters, and to the further development of fossil fuel resources;
- stimulate new industrial opportunities in the province through the establishment of technology-based manufacturing and service industries;
- improve the quality of life in the province by providing, through health-care research, the finest medical services at the most reasonable cost by reducing industrial and urban pollution and by protecting the natural environment from lasting damage; and
- facilitate in all recognized disciplines, the accumulation of scientific and technological excellence in the region and, in so doing, provide opportunities for young people who are receiving advanced training in our educational system, to become involved in the social and economic development of the province.

AWARDS

The Graduate Research Engineering and Technology (GREAT) Awards are designed to encourage graduate students to work on research projects for local companies. The awards provide a scholarship of $8500 per year for a maximum of three years to graduate students at British Columbia universities who are working on projects in co-operation with local industries and organizations.

The Industrial Post-Doctoral Fellowship (IPDF) is designed to stimulate the employment of recent doctoral graduates in private industry. The award provides a subsidy of $18 000 for a maximum of two years to the salary of a recently qualified PhD employed with a British Columbia company. This is to provide an incentive for companies to develop their research capabilities, and allow an easy transition from an academic background to an industrial one for the award holder.

The BC Science and Engineering Awards are annual awards recognizing the contributions of local scientists and engineers to the economic and social development of British Columbia, including contributions to the understanding and appreciation of science by the public. Awards are made to both senior researchers who have made extensive career contributions, and younger investigators who have made an outstanding contribution. A gold medal and citation are presented to each award recipient. A maximum of three awards from among the following categories may be made in any year:

- Natural Sciences: This award is made on the basis of work done in British Columbia, or by a person normally resident in the province who has made an outstanding contribution to an advance in understanding in any of the natural sciences;

- Health Sciences: This award is made on the basis of work done in British Columbia, or by a person normally resident in the province who has made an outstanding contribution to an advance in understanding in any of the health sciences;
- Engineering and Applied Sciences: This award is made on the basis of work done in British Columbia, or by a person normally resident in the province who has made an outstanding contribution to an advance in understanding in any of the engineering or applied sciences; and
- Industrial Innovation: This award is given for a concept originated and developed in British Columbia. The concept must also have led to the production of goods and/or services that have been marketed on a significant scale.

The 1981 BC Science and Engineering Gold Medals went to Dr Clayton O. Person of the Department of Botany at the University of British Columbia; Dr David Suzuki, well-known interpreter of science for the general public; and Dr John B. Warren, who directed the development of the TRIUMF Nuclear Facility in Vancouver.

SECRETARIAT ON SCIENCE, RESEARCH AND DEVELOPMENT

The primary responsibility of the secretariat is to provide administrative services to the Science Council, such as the preparation of material for meetings, implementation of council programs, response to public enquiries, and the financial administration of council affairs. In particular, the secretariat has established and co-ordinates the procedures for the evaluation and funding of research projects, GREAT graduate scholarships, and industrial post-doctoral fellowships.

The secretariat provides a similar service to the BC Health Care Research Foundation, which makes awards available for the support of medical and health care research related to provincial concerns.

The secretariat also attends meetings of the Internal Research Advisory Committee — the provincial government's in-house research co-ordination and review body — with representatives from all ministries involved in natural sciences research. This committee is chaired by the Deputy Minister of Universities, Science and Communications.

Liaison is maintained with the federal government and its agencies, such as the Ministry of State for Science and Technology, Statistics Canada, the Department of Supply and Services, the National Research Council, and other provincial governments and research organizations.

OTHER ACTIVITIES

To further the establishment of a Science Centre in British Columbia, council awarded $100 000 in January 1982 to the Vancouver-based Arts, Sciences and Technology Centre Society to enable them to proceed with the hiring of their first director, and to develop certain scientific exhibits. The Arts, Science and Technology Centre Society is temporarily housed at 600 Granville Street in downtown Vancouver.

In order to increase public knowledge of science and technology in BC, council funded the development of a 22-minute colour documentary video film entitled Images for Tomorrow. This film, which had its premiere in Trail in October 1981, features several of the research projects supported by funds from council. Among these are studies into the use of gallium arsenide in solid state electronics. Film showings were provided during

the year in a number of other centres throughout the province.

The council's exhibit at Discovery Fair in October 1981 offered a further view of scientific activity in the province. The film, Images for Tomorrow, was part of the display, which presented an interesting review of several research projects funded by council.

Council continued to maintain contact with various government and industrial organizations in its role as a senior policy advisory body. The council maintained its role in overseeing the progress at BC Research in its coal liquefaction and fisheries technology programs. Funding was also provided to BC Research to support its demonstration program on the use of compressed natural gas (CNG) as a vehicle fuel.

SCIENCE GRANTS PROGRAM

Through the ministry's support, a research fund has been established by the Science Council to award grants for research projects consistent with the council's stated objectives. The following categories have been recognized, each having a sub-committee appointed by the council:

- electronics and communications;
- energy;
- forests and forest products;
- food and agriculture;
- manufacturing;
- mining, minerals and metals;
- aquatic sciences; and
- transportation.

Projects are selected by a process of peer review by active researchers. Whenever possible, co-operation between university and industry is encouraged and, in several instances, projects are being carried out jointly.

RESEARCH COMPETITION NUMBER FOUR (RC-4)

In August 1981, the results of the RC-4 were released. Funding for 36 grants for applied scientific research, valued at $2 253 448, was announced. The largest grant was awarded for research involving the use of microbes in leaching potentially hazardous radionuclides out of mine tailings.

Other projects that received awards at this time included:

- isolation and identification of the female sex attractant pheromone in an effort to control the winter moth which has caused much damage to tree and shrub foliage on southern Vancouver Island;
- a method of cultivating edible kelp;
- development of a floating culture system in which manila clams, pinto abalones, and weathervane scallops can be reared from the juvenile stage and protected from normal predators and other causes of early mortality;
- design and evaluation of grow-out systems for commercial scallop aquaculture in BC;
- ways to automate the operation of the many projectors used in various planetariums in North America;
- development of lithium storage batteries for potential use in electrical cars;

- isolation of potentially hazardous compounds in pulp mill effluents at an early stage in the pulp-making process;
- use of micro-organisms to produce protein from pulp and paper wastes;
- study into problems related to renewal of certain commercial timber species in the interior of BC;
- ways of running the high-intensity Vortek lamp using alternating current; and
- a study into the shapes and efficiency of certain plane structures that can be used in hydro-foil boats and related craft.

RESEARCH COMPETITION NUMBER FIVE (RC-5)

The fifth research competition awarded $2 427 295 in grants to 40 research projects. Among the successful applications was a grant to Vortek Industries that will enable the company's research staff to continue work on outdoor applications for their high intensity arc lamp.

Awards were also made for:

- a study into the various frequencies of sound as a means of reducing the growth of the Eurasian water milfoil;
- development of new cutting attachments for chain saws that should significantly reduce both noise and vibration; and
- a system that will enable users of the Telidon process to compose 'pages' for use in that format.

A higher proportion of grant applications are now coming from the private sector than was previously the case. This year, about 43 per cent have come from industry, 45 per cent from universities, and 12 per cent from other research organizations. The Science Council spends considerable time with professional organizations and at conferences explaining its role and outlining how it can help provide funds to broaden the industrial base of the province. This activity has helped ensure a large proportion of applications from industry.

BRITISH COLUMBIA RESEARCH COUNCIL

The BC Research Council is an independent, non-profit society incorporated in 1944 under the Society Act of British Columbia.

ROLE AND FUNCTIONS

The council was established to provide facilities for the encouragement and promotion of technological research and services, with particular application to the industrial development of the Province of British Columbia. The council consists of approximately 110 members, mainly resident in British Columbia, who are concerned with the advancement of science and technology in the province.

Since its inception, the council has operated a scientific, engineering and technical laboratory facility called BC Research. The laboratory conducts research, development, and other technical work under contract to sponsors both in industry and government, as well as its own research on new technical developments. While BC Research undertakes research of provincial interest and importance, the majority of its activities are not directly funded by the provincial government. Approximately two-thirds of BC Research revenue is derived from industrial and other government contracts.

The management of BC Research is directed by a board of management and an executive director. There are 21 members on the board from industry, the provincial and federal governments, universities, labour, and the staff of BC Research.

Techwest Enterprises Ltd., a development company incorporated in 1970 under the British Columbia Companies Act, is a wholly-owned subsidiary of the British Columbia Research Council. It has its own board of directors and operates independently of the council. The role of Techwest is to make the technological products developed by BC Research and other research groups available to the marketplace.

PROJECTS AND ACHIEVEMENTS

In June 1979, the consulting firm of Philip A. Lapp Limited issued a report, with recommendations for the future, on the operation of BC Research and Techwest Enterprises Ltd. One recommendation was that the provincial government should make greater use of BC Research staff and facilities for the industrial development of the province. In accordance with this, the ministry provided initial funding for the establishment of research into fisheries technology at BC Research and, later in 1979, initiated plans for research in coal liquefaction. The Lapp Report called for the establishment of a large, industrially-oriented program of research and development, with the provincial government providing core funding. During the fiscal year 1981-82, BC Research continued work on programs funded by the ministry in fisheries technology and coal liquefaction, and began exploratory work in biotechnology as a new area with significant potential for the province.

Fisheries Technology Program

This program was established to provide technical information and to do research for the processing sector of the BC fishing industry. Study topics for the program are developed with the guidance of the Technical Advisory Committee, with representatives from industry, government, and universities.

One of the projects in the Fisheries Technology Program is the development of a method of freezing salmon eggs with the aim of improving genetic selection. This method also makes possible the replacement of populations depleted by environmental damage.

BC seafood products are sold world-wide. The technical information service is particularly concerned with smaller processing companies who may find it difficult to keep up with new methods and technologies. Contacts with the industry are made by phone, visits to the laboratory for discussions, or through regular visits to plants by scientific staff, who then work directly with industry to solve practical operating problems. These technical enquiries have arisen from both large and small companies regarding a range of topics, including processing of specialty products, quality problems, weight control, grading and handling, and shellfish processing.

Enquiries are handled on an individual basis and in complete confidentiality. Where a request requires detailed investigations beyond what can be fairly assigned under the technical information service, assistance is provided to the company in applying for government research and development assistance programs.

The research program is focussed on topics relating to salmon, herring, groundfish, and shellfish.

Quality is the single, most important factor influencing the sale of BC seafood products on foreign markets. During 1981, studies were done to

determine ways to extend the shelf life of fresh groundfish fillets intended for sale to export markets. Presently, this concern for quality is being extended to an analysis of grading criteria for groundfish and salmon. Work is also underway to prepare, for industry, a manual on health practices to protect the quality of BC canned salmon.

The effective use of by-products is becoming increasingly important to the economics of fish processing. In British Columbia, the prime example is the production of sujiko, a salmon roe product with annual export sales of approximately $20 000 000. Work at BC Research has involved the development of quantitative grading standards.

Salmon caviar is a by-product with potential for greatly increased sales, particularly in Europe and North America. The fisheries technology group undertook a study of salmon caviar to:

- quantify, standardize, and improve production techniques;
- quantify the indices of product quality; and
- demonstrate production technology to BC processors.

The program has been carried out in the laboratory and in commercial plants where, during the past year, 32 small industrial lots were produced.

Work on improving the quality of herring roe continued, with the examination of processing conditions and the problem of loss of quality during storage. As an example of the practical relationship between BC Research and industry, assistance was provided to a BC processor, involving negotiations with foreign buyers concerned with quality. The assistance resulted in substantial economic gains for the company.

Further ongoing studies will involve working with the shellfish industry in examining processing technology. BC Research has developed a steam-opening system for oysters that will undergo plant trials in 1982, and has been working with government to develop secondary processed oyster products.

Miscellaneous products are continuing in areas as diverse as aquaculture, salmon ranching, and fermented or hydrolyzed fish products.

Information from the Fisheries Technology Program is available to all members of the industry through a newsletter, industry information reports, and technical reports.

Coal Liquefaction Program

With the support of the ministry, major funding for the coal liquefaction program was obtained through a contract with the Energy Development Agency. Additional funding, relating to test work on specific coal samples, was obtained from regional and national firms.

Highlights of the 1981-82 research program were liquefaction tests on a wide range of BC coals, initial evaluation of catalysts for liquefaction and product upgrading, and construction of continuous systems for both coal liquefaction and catalytic upgrading of liquid products.

Tests on Hat Creek coal, the only well-explored provincial sub-bituminous coal deposit, indicated that direct liquefaction results in high yields of good quality liquids. Conversions of more than 80 per cent of dry ash-free coal were obtained under a range of practical operating conditions with moderate hydrogen consumption and low by-product gas formation.

Results of studies on bituminous coals indicate that BC deposits with relatively high volatile matter and reactive macerate are good raw

Spouted-bed pyrolysis is one method of extracting liquid fuels from coal. Two researchers work with some of the equipment used in the coal liquefaction process.

materials for direct liquefaction. Suitable deposits identified to date are located in the central interior and northwest zones of the province. Tests on low to medium volatile coking coals currently being mined, indicate that these coals are not particularly good raw materials for direct liquefaction. Conversion yields of 60 to 80 per cent can be obtained by making the most of conditions and catalysts, but products include a large fraction of non-distillable material that would require extensive secondary upgrading.

Evaluation of catalysts used in existing developmental processes indicates that catalytic effects are highly specific to the coal, catalyst, and test conditions. For example, commercial cobalt-molybdenum formulations give good results with sub-bituminous coal, but moderate to poor results with bituminous coals.

Construction of the continuous coal liquefaction system, capable of processing relatively large quantities of coal (2300 to 9000 litres per hour) is virtually complete. Construction of the continuous hydrotreater has been completed, and the two units will be used in produce-residue separation studies and in upgrading tests.

These three fermenters are being used in a biotechnology project. Certain bacteria that feed upon methane can be used to ferment natural gas, producing potentially valuable chemical by-products.

Biotechnology Program

BC Research identifies new areas for examination as potential programs for significant core funding. This year it initiated an effort in applied biotechnology directed to problems of specific interest to the province.

The initial project is the fermentation of natural gas, an abundant resource of British Columbia. This topic was selected for the novelty of the technology in Canada, the interest already expressed by several energy companies for joint participation, and the receipt by BC Research of an award from the National Research Council for work in this area.

The overall objective is to convert methane – the predominant component of natural gas – into commercially more valuable products, using the expanding technology of applied biology.

About 50 micro-organisms capable of growing on methane have been isolated. The next step in the project will be to screen these organisms for their ability to produce desirable chemicals, and to determine the most favourable growing conditions.

This project has already been successful in finding one culture which will produce abundant quantities of a large carbohydrate directly from methane and air.

The Bio-Engineering Division has assembled equipment for methane fermentation studies, and is now able to conduct laboratory-scale work under a wide variety of experimental conditions.

While the natural gas fermentation project will receive primary attention, there are a number of other areas of applied biotechnology of potential interest to BC industry. These include:

- the use of sawdust for the simultaneous production of edible mushrooms and animal feed supplements;
- the use of apple pomace for the production of oyster mushrooms; and
- the production of steroids from tall oil pitch.

These potential projects will be discussed with local industry representatives to determine their scientific and economic merit. Work will begin on one or more of the products, if industrial support and economic potential warrants such a project.

DISCOVERY FOUNDATION

Discovery Foundation, funded by the Ministry of Universities, Science and Communications, is a registered non-profit society in the province, established to pursue the advancement of scientific, technological, and industrial research skills in British Columbia.

The following are members of the Discovery Foundation Board of Trustees:

H.E. PETCH, Governing Trustee, President, University of Victoria;
J.V. CLYNE, Board of Governors, University of British Columbia;
D.M. BROUSSON, Dean, Continuing Education & Industry Services, British Columbia Institute of Technology;
H. EPPICH, President, Ebco Industries;
G.H.D. HOBBS, Corporate director and private investor;
D.T. KENNY, President, University of British Columbia;
N.B. KEEVIL, Jr, President, Teck Corporation Ltd.;
P.L. McGEER, Minister of Universities, Science and Communications;
J.C. MADDEN, President, Microtel Pacific Research Ltd.;
J.S. MacDONALD, President, MacDonald Dettwiler & Associates Ltd.;
K.G. PEDERSEN, President, Simon Fraser University;
T.G. RUST, President, Crown Zellerbach Canada Ltd.;
T.J. RYAN, Corporate director;
G.C. van ROGGEN, Senator.

ROLE AND FUNCTIONS

Discovery Foundation works toward broadening and strengthening the economic base of the province by enhancing the establishment and growth of scientific and technological industries, skills, and expertise with local and world markets. Acting as a charitable institution without profit to its members, Discovery Foundation operates for the benefit of the people of British Columbia and the post-secondary institutions participating in the Discovery Parks.

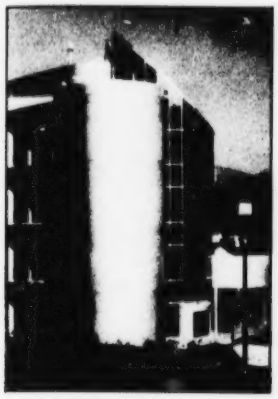
PROJECTS AND ACHIEVEMENTS

Discovery Foundation has a wholly-owned subsidiary, Discovery Parks Incorporated, which was designed to create world technology research parks adjacent to the principal education centres in the province — Simon Fraser University, the University of British Columbia, the University of Victoria, and the British Columbia Institute of Technology. The Discovery Parks are designed to:

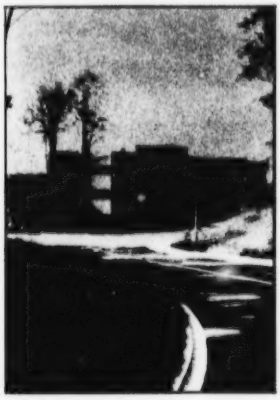
- stimulate development of high technology industries within the province;
- encourage the growth of research and development;
- promote an interaction between tenants of research parks and the students and faculty in adjacent learning institutes;
- provide employment opportunities for graduate students; and
- provide a bridge between scientific innovation and industrial application of high technology.

The following criteria form the basis for approval of organizations wishing to take advantage of locations in the parks:

- operations in the parks must be primarily concerned with research and technology;



This new multi-tenant facility at Discovery Park on the campus of the British Columbia Institute of Technology provides space for industry to locate research laboratories in proximity to the academic research facilities of the departments of technology.



First tenant at Simon Fraser University Discovery Park . . . Microtel Pacific Research Limited.

- research or technology related to products designed for the destruction of human life will not be permitted;
- product manufacture or assembly shall be limited to development;
- pilot plants will be permitted in which processes planned for use and production elsewhere can be tested; and
- only nuisance-free, clean operations will be permitted.

The Multi-Tenant Facility adjacent to the BC Institute of Technology will be substantially completed by the end of May 1982. Several tenants have completed working drawings and are beginning leasehold improvements. Leases are presently being negotiated with several other prospective tenants, and indications are that the building will be fully leased by year-end 1982. MacMillan Bloedel Limited have entered into an agreement with Discovery Parks Incorporated whereby they may lease a 17-acre site for the purpose of constructing a $20 million research facility. A development Permit has now been granted and issued by the Corporation of the District of Burnaby; however, actual construction is awaiting approval by the board of MacMillan Bloedel Limited, scheduled to meet prior to the end of the year.

The first major tenant at Simon Fraser University, Microtel Pacific Research Limited, is presently occupying a building they designed and constructed. Roads, sidewalks, lighting, utilities, and landscaping at the Simon Fraser University site are progressing on schedule.

Agreement was reached between the University of British Columbia and Discovery Parks Incorporated for the construction of a Discovery Park at the University of British Columbia, beginning in 1982.

Funding requirements for the Discovery Park aspect of the Life Sciences Building at the University of Victoria are awaiting Treasury Board approval.

THE FUTURE

Future projects presently under development include:

- the Mariculture Research Centre, Nanaimo;
- the Fish Technology Centre, University of British Columbia; and
- the following Regional Research and Development/High Technology Business Centres: Okanagan College, Kelowna; Northern Lights College, Dawson Creek; New Caledonia College, Prince George; Caribou College, Kamloops; and Selkirk College, Nelson.

Discovery Foundation encourages the development of high technology industry and other economic activity where a large proportion of the value added comes from the use of scientific and technical knowledge and skills. This provides opportunities within the province for skilled young people who will now not have to choose between seeking employment outside the province, and working at occupations less suited to their talents, in order to remain in British Columbia.

COMMUNICATIONS DIVISION

The Communications Division is comprised of two principal branches, the Telecommunications Services Branch and the Communications Development Branch, formerly titled the Communications System Development and Regulation Branch.

Some of the major responsibilities of the division are to:

- plan, furnish, and manage the government's internal communications systems so as to enable government ministries and agencies to function effectively;
- develop, recommend, and implement policies and acts in regulatory matters to help promote the orderly development of communications in British Columbia;
- support research and development to encourage development of the telecommunications industry in the province;
- provide grants and consultation for communities to improve their telecommunications services; and
- maintain industry and inter-government liaison with respect to provincial and national issues, to provide the capability to achieve maximum benefits from telecommunications for the people of British Columbia.

TELECOMMUNICATIONS SERVICES BRANCH

ROLE AND FUNCTIONS

A principal function of the Telecommunications Services Branch is to ensure that government ministries, crown corporations, and agencies are supplied with the telecommunications services they need to deliver the programs assigned to them by the Legislature. Telecommunications includes electronic transfer or transport of voice, data, paper documents, and printed text.

Principal telecommunications facilities— switching equipment, local lines, inter-city lines, and terminal devices— connected to the public switched network are leased from commercial communications carriers. Nevertheless, the branch plays a key role in the planning, engineering, and management of these facilities.

Traditionally, the branch has done all ordering, billing, budgeting, and paying for the service, with the result that user clients have not been aware of the costs involved. However, rapid expansion of service requirements, and continued sound financial management of the facilities, now require an ongoing cost-benefit analysis with user participation.

To encourage greater client participation in the budgetary and financial responsibilities of these services, the branch is in the early stages of a program to charge increasingly more of the costs to respective user clients. To this end, Telecommunications Services Branch is now engaged in a project to automate all branch records, with emphasis on ordering and billing.

The branch also provides the following telecommunications services not normally connected to the public network: mobile radio communications systems, intercoms, sound reinforcement, paging, and closed-circuit television systems. These systems are usually owned by the government and designed, implemented, and maintained by branch personnel.

Major switchboards are operated by branch personnel in Vancouver, Victoria, Kamloops, and Prince George. The branch also assists with the operation of hundreds of small switchboards and answering units staffed by client personnel.

The Telecommunications Services Branch is meeting the growing demands for telecommunications consultation from its regular clients and from organizations outside of government— such as schools and hospitals— who receive a significant portion of their funds from government.

PROJECTS AND ACHIEVEMENTS

A major commitment of the Telecommunications Services Branch is the design and installation of a new telephone switching system to replace the antiquated equipment shown below.

Major projects during the past year have been the maintenance of the existing telephone system and the ongoing design for the future network. The design phase of the project has been conducted in conjunction with representatives from the BC Telephone Company and Consultec Canada Ltd.

In order to maintain the existing network, and prepare for the installation of new equipment, a program was implemented to replace some of the more antiquated telephone and switching systems with modern computer-based systems. Consequently, 55 new private branch exchanges have been purchased for replacement of outmoded equipment and for new installations as required.

The number and complexity of requisitions increased over the year, with an additional 564 orders to a total of 3647 being placed with suppliers. Technological advancements in telecommunications equipment greatly increased the complexity of the analysts' work. Because of complicated design and analytical requirements, more time has been spent in the consultative role with client ministries.

Major telecommunications projects were involved in the reorganization and redistribution of the Ministry of Forests regional and district offices; the establishment of Ministry of Environment regional offices, particularly in the Vancouver area; the construction of combined Ministries of Health and Human Resources health centres; and the communications systems for several new or refurbished provincial courthouses throughout the province. In addition, the Common Carrier Section provided services to the Hospital Programs Branch of the Ministry of Health to assist in the selection of major equipment requisitions for provincially-funded hospitals, either as part of new construction or upgrading programs. This involved the section in a direct consultative role with several of the province's larger hospitals.

The Government Message Centre continues to provide an efficient service, with message traffic increasing as ministries continue to make more use of the facility. Constant watch is being maintained to ensure the adequacy of transmitting and receiving both message and facsimile traffic.

In 1981-82, the branch, through its Technical Services Section, installed a new radio communication system to serve the BC Ambulance Service throughout southwestern British Columbia. This system provides reliable

VHF mobile radio communications for ambulances operating throughout Greater Vancouver, the Fraser Valley, through the Hope-Princeton Highway, the Boundary Area, and the South Okanagan. The project entailed establishing eight mountain-top radio sites to provide the required coverage and a UHF trunking system to link these stations back to new regional dispatch facilities in Vancouver and Kelowna.

The system, which serves over 60 per cent of the population of the province, will improve ambulance response times in emergencies, eliminate duplicate call-outs, and provide a more controlled and cost-effective means of delivering ambulance services to the public.

There was continued upgrading and expansion of radio equipment and systems to meet new requirements and the growth demand of such agencies as the Co-ordinated Law Enforcement Unit, the Sheriffs Service, Fish and Wildlife, Parks, and Corrections Branch. This included five repeater systems which provide wide area radio coverage, and the installation of 21 radio base stations throughout the province. An example is the Sheriffs Service Peace River System, which provides radio communication throughout the region from Chetwynd through Dawson Creek to Fort St. John. This system not only improves operational and administrative effectiveness, but increases prisoner escort security and the safety of Sheriffs Services personnel. Approximately 150 new mobile radios and portables were also added to client systems. In addition, some 100 radio telephones, used only seasonally, were purchased from BC Tel and placed into service.

The branch continued the administration of over 3000 federal Department of Communications licences covering government radio equipment, involving completion of some 350 licence applications over the year. Installation and maintenance transactions, excluding work undertaken in-house, numbered over 400.

To improve technical and financial management of the provincial government's $3 million radio communications equipment and $1.5 million investment in auxiliary communications systems, an inventory system is being developed which will enable the branch to provide better service to client ministries and agencies, and fulfill Communications Canada licencing requirements. The inventory system is expected to be functional on a manual basis, with early computerization to follow in order to expand the system's scope and effectiveness.

During the year, auxiliary communications systems were designed and installed in new courthouses in Sidney, Campbell River, Terrace, Houston, Invermere, and Burns Lake. These systems consist of courtroom sound reinforcement, public address, intercom, closed-circuit television, and personal and perimeter security sub-systems. Auxiliary systems were also installed in correctional centres, courthouses, and other government facilities throughout the province. Plans and specifications were completed for major auxiliary systems for the new Pre-Trial Services Centre in Vancouver. In addition, auxiliary systems for eight other courthouses and three correctional centres were at various stages of planning and design.

As part of the branch's responsibility to maintain the sound and distribution systems in the Legislative Buildings, a study was undertaken to evaluate the existing systems and develop plans for upgrading and expansion.

THE FUTURE

Continuing advances in telecommunications technology, and increasingly complex requirements for good communications services by client ministries will continue to challenge the branch to meet service demands.

A major undertaking for the immediate future is the installation of a new province-wide telecommunications network to replace the present outmoded system. The new system, an integrated voice and data network, will eventually provide complete digital transmission, and will be a model of advanced technology and automated office intercommunications. The change will provide an immediate and significant improvement in interprovincial communications, as well as reduce overall operating costs. The network is to be implemented over a three-year period, and is designed to provide the most up-to-date and efficient telecommunications services.

The future of existing teletype and facsimile systems is in doubt, as advances in word and voice stores and forward messaging systems seek to replace the existing systems. Future network provisions will enable any terminal to provide message communications which will outdate present-day facilities.

An engineering feasibility study will be undertaken on the joint use of government-owned radio systems to determine the best use of existing plant and frequency spectrums, and to accommodate the requirements of the smaller client ministries in need of wide area coverage and network capability, who are unable to justify individual private systems.

The BC Ambulance Service radio system will be expanded in the Prince George region, to extend radio coverage and central dispatch capability west along Highway 16 to Houston, and north along Highway 97 to Fort St. John. The Nanaimo Region will also be expanded, including the establishment of new sites in the Courtenay and Port Alberni areas, to cope with the rapidly rising call volume in this part of Vancouver Island.

The Combined Law Enforcement Unit Digital Scrambler Radio System, which provides secured voice communication for field units, will be extended to include the areas of Haney, Langley, Aldergrove, and Abbotsford.

The Parks Branch Okanagan radio repeater system, using a site on Silverstar Mountain, will provide wide area VHF radio coverage enabling two-way radio communication between field staff throughout the district for security purposes, to meet operational needs, and to provide safety for staff located in isolated areas such as Monashee, Cathedral, and Mabel Lake provincial parks.

COMMUNICATIONS DEVELOPMENT BRANCH

The Communications Development Branch consists of the Administration, Policy, Corporate Relations, and Technology Applications sections, and includes engineers, accountants, economists, policy analysts, and research officers.

ROLE AND FUNCTIONS

The role of the Communications Development Branch is to facilitate action by the Government of British Columbia to make the best use of the social and economic benefits of telecommunications for the people of the province. The branch promotes the orderly development of the telecommunications industry in British Columbia through recommending and implementing policies, supporting research and development, and acting on behalf of the people of British Columbia in regulatory matters. It administers grants to communities to improve their communications systems, and maintains industry and inter-government liaison on provincial and national issues.

The branch, formerly known as the System Development and Regulation Branch, was reorganized in October 1981 to establish a Policy Section — with a more clearly defined mandate than the former System Development Section — to develop policies and analyse their effect. With the shifting emphasis from regulation to the development of industry in the province, the former Regulation Section became the Corporate Relations Section, with greater emphasis on the development of communications-oriented industry within the province. The Technology Application Section brought the technical support staff together into one section which provides technical advice to the Policy and Corporate Relations Sections, and carries out the administration of technical programs within the branch. This includes the administration of the Communications Grant Program.

Branch personnel work with counsel from the Ministry of Attorney General to prepare the government's case and advise counsel during regulatory hearings; with the Ministry of Intergovernmental Relations staff on the development of the electronics and communications industry in British Columbia; and with the British Columbia Utilities Commission, providing advice on regulatory matters in the communications field. While a functional separation of the various sections in the branch exists, there is close co-operation on shared responsibilites.

PROJECTS AND ACHIEVEMENTS

The Quebec meeting of provincial communications ministers in February 1981 led to the creation of a joint Communications-Education Working Group on Satellite Educational Communications. A final report was produced, to be considered at the provincial ministers' next meeting.

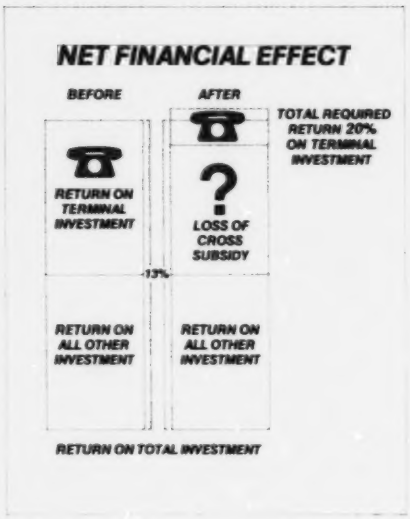
During the summer, federal-provincial working groups — in which the branch participated — completed final reports on cable delegation, on industry structure and competition, and on industrial strategy. These reports were tabled at the September 1981 meeting of communications ministers in Winnipeg.

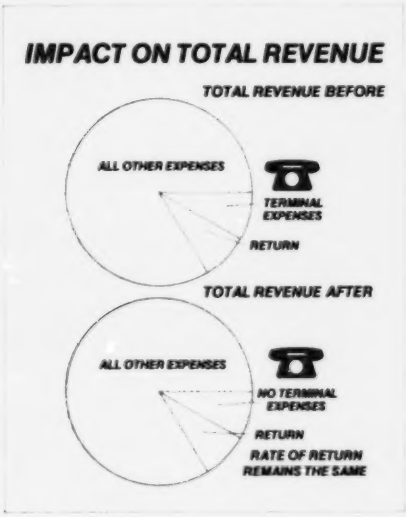
The September ministers' meeting established a Committee of Deputy Ministers charged with seeking ways to fuse federal and provincial views on pay-TV. The required submissions were provided by the branch, and the branch director supported the deputy minister at one of the negotiating sessions. Ministers also directed officials to consult on trans-border satellite negotiations and the branch participated in this activity. A Task Force on Joint Regulatory Mechanisms was established to consider regulatory issues affecting more than one province. Branch officials also

assisted in the preparation of a report on options for ministers, to be tabled at the next meeting of deputy ministers.

When the Canadian Radio-television and Telecommunications Commission (CRTC) opened hearings on pay-TV in September, British Columbia made representation which detailed the province's position on jurisdiction. The branch prepared the province's entry in the field of pay-TV and non-broadcast cable regulation, culminating in two Orders-in-Council, assented to in February 1982, directing the British Columbia Utilities Commission to open hearings on these matters.

These graphic aids were used as part of British Columbia's presentation to the CRTC at the Terminal Interconnect Hearing held in Ottawa.





Terminal Interconnect Hearing

In the late fall of 1981, the CRTC held a public hearing on the attachment of subscriber-provided equipment to the carrier's network. The branch prepared the province's intervention, and advised counsel furnished by the Attorney General at the hearing. The decision of liberalized interconnection provisions will be a significant move towards the development of competition in the telecommunications equipment market.

BC Tel Rate Case

On November 2, 1981, BC Tel applied to the CRTC for a general rate increase, to become effective May 1, 1982. The company proposed increases of 28 per cent for basic residence service and 37 per cent for basic business service, plus other miscellaneous increases. Regional hearings were held in Nanaimo, Haney, Vancouver, and Kimberley before the commencement of the central hearing in Vancouver on February 16.

Staff, represented by counsel from the Attorney General, attended the proceedings, cross-examined BC Tel witnesses, and submitted final argument on behalf of the provincial government. While recognizing that BC Tel required a minimum rate of return to maintain financial integrity, the province argued that BC Tel's quality of service did not meet the standards established by the CRTC in its previous decision, referred to in last year's report. Therefore, BC Tel should not be awarded the full increase requested for basic telephone service.

The CRTC decision of May 1982 approved increases of 18 per cent in basic residence rates and 23 per cent in basic business rates. In awarding less than the requested increases, the CRTC noted that this was an appropriate response to the failure of BC Tel to meet the quality of service standards set down in 1981.

BC Tel Construction Program

In its 1981 BC Tel rate case decision, the CRTC initiated a process for an annual review of BC Tel construction plans and their progress. Staff attended the first review meeting held in Vancouver in November 1981. The meeting afforded an opportunity for interested parties, BC Tel, and CRTC staff to discuss the company's future plans outside the constraints of a formal regulatory proceeding.

CRTC Cost Inquiry

On December 15, 1981, the CRTC announced Phase III of its continuing inquiry into the costing of telecommunications services. The inquiry is to determine the appropriate method of costing current monopoly and competitive services of existing carriers, including Telesat Canada, Canada's domestic satellite company. Through these proceedings, the CRTC will assess whether competitive telecommunications services are covering their costs, and not placing a burden on subscribers of monopoly services such as basic telephone service. The branch engaged the services of professional consultants to develop a framework for the province's participation in the inquiry. Subsequent participation was curtailed due to budget restraints anticipated in the 1982-83 fiscal year.

Industry Development

Since the reorganization of the branch, the Corporate Relations Section has had a new mandate to encourage research and development and electronics manufacturing in British Columbia. As part of this mandate, the section established formal liaison with the Ministry of Industry and Small Business Development to deal with matters of industrial development. The closer co-operation of the two ministries is highlighted by the ministries' joint funding of British Columbia participation in the government-industry study of foreign marketing strategies in telecommunications equipment. The study also involves the governments of Canada, Ontario, Quebec, and various Canadian equipment manufacturers.

The section has continued to review applications under the Foreign Investment Review Act which may affect the communications industry in British Columbia. Applications are referred by the Ministry of Industry and Small Business Development.

Late in the fiscal year, at the request of the minister, the Corporate Relations Section began an investigation into the feasibility of holding

a satellite conference and trade show in British Columbia. Initial reaction from the industry was highly encouraging.

Complaints

During the year, the branch investigated complaints regarding telephone service provided by BC Tel, and concern about radio, television, and cable services in the province. While the primary responsibility for dealing with these complaints lies with the CRTC, the branch seeks to assist residents of British Columbia with their service problems. A number of these complaints have been satisfactorily resolved by direct negotiation of ministry staff with the companies involved.

Communications Grant Program

The branch administers communications grants which provide financial assistance to communities seeking to improve communications services, and obtain educational programming.

A general grants program assists with the capital cost of installations to extend conventional communications services to rural and remote communities. Grants are directed towards the establishment of a first service, the introduction of CBC and BCTV service, and assistance in the construction of community-owned facilities. During the past year, grants have been approved for community associations to provide improved television service through cable and off-air systems to over 1000 households in seven communities, and improved installations for co-operative radio serving 20 000 listeners. The improvement of terrestrial delivery systems has been superceded to a large extent by satellite systems embraced by the Program for Education and Entertainment Television Services (PEETS).

This program has been introduced to assist with the capital cost of satellite earth receive and distribution systems. PEETS was designed to assist small communities to receive and distribute education and entertainment television channels available on the Anik B satellite. The channels that have been available are the Knowledge Network, CBUT (CBC) Vancouver, and CHAN (BCTV) Vancouver. The principal focus of the PEETS grant program has been the distribution of Knowledge Network education programming to communities with populations up to 2500.

During the past year, PEETS grants have been approved for 20 community associations serving approximately 23 000 households in 86 small communities and rural areas. At the year end, grant requests from a further 30 community associations were being processed. In addition, staff assistance is provided to communities on an ongoing basis in the preparation of grant applications.

Zone Plate Antenna

A novel antenna for receiving television signals from satellites was developed by ministry staff. The antenna, called a zone plate, invented by the deputy minister, was constructed and tested by the staff of the ministry, with assistance from the Ministry of Provincial Secretary and Government Services staff.

The zone plate principle, which is normally used in optical applications, has been applied in this case for use with microwave television signals transmitted by satellite. Being readily built from flat sheets of plywood,

the cost of a zone plate is significantly less than that of a conventional parabolic antenna. Although tested successfully, further development and design modifications are being studied. Innovations of this kind, along with improvements in receiver electronics, will drastically reduce the cost of satellite receive earth terminals. Several hundred copies of the specifications for the zone plate have been supplied to members of the general public.

Miscellaneous Activities

Branch staff participated in an inter-ministry committee investigating the possible introduction— with government support— of a 911 emergency number on a province-wide basis. While the committee recommended support, Cabinet did not find it economically feasible at this time. As a result, further studies in support of this project have been postponed.

Support was provided to the administrative staff of the new Tumbler Ridge Town (NE Coal) in their negotiations with BC Tel for telephone services. Discussions were also held on alternatives for broadcast, closed-circuit, and educational television service.

The branch, along with the Pacific Region of the federal Department of Communications, initiated a joint Communications Consultative Committee for the exchange of information on activities being undertaken in each jurisdiction, including Ottawa, and those activities undertaken by the CRTC.

THE FUTURE

The interest of the public in obtaining the educational programming of the Knowledge Network has been extremely high. The PEETS program will continue to respond to this interest, while new ways for delivery and for the economic enhancement of delivery systems will be pursued.

An urgent requirement exists to facilitate the delivery of conventional radio programming to small remote communities. Investigations have already begun for the delivery of radio via satellite, and these will be expanded.

In the near future, the branch will be continuing its work on the proposed satellite conference and trade show. Branch staff will be required to assist the BC Utilities Commission in hearings on pay-television and other telecommunications concerns. Staff will be presenting briefings to the commissioners prior to the hearings. Staff will also be participating in the second annual BC Tel Construction Program Review meeting scheduled for Vancouver in late 1982.

The federal and provincial communications ministers will meet again in May 1982, their concern being the future of communications in Canada, particularly regarding pay-TV and satellites. Provincial communications policies will continue to evolve, and provincial jurisdiction will be pursued through negotiation and, if necessary, through court action.

METRIC CONVERSION AND STANDARDS INFORMATION OFFICE

In 1970, the Canadian Parliament unanimously endorsed the government White Paper on Metric Conversion that proposed the adoption of the International System of Units (SI) in Canada.

Three years later, the Government of the Province of British Columbia formed an Interministerial Metric Conversion Committee to co-ordinate metric conversion within government. The BC Metric Office was established the following year to serve as the committee's secretariat, and as a technical consultant service to government and industry.

In 1976, by agreement with the federal government, the BC Metric Office set up a Metric Information Centre to provide information on metric conversion.

Monitoring the conversion of retail scales to metric, and providing information to business and the general public were major projects of the Metric Office in 1981-82.

ROLE AND FUNCTIONS

The Metric Conversion and Standards Information Office assists governments, industry, and associations in the orderly conversion to SI units of measurement at minimum cost and with the least disruption and inconvenience. The office also provides a standards information service for the technological support to business and industry. Of necessity, public information— although the responsibility of the federal Metric Commission— is also provided by the provincial Metric Conversion and Standards Information Office.

The office achieves its goal by providing:

- a metric conversion information service;
- a technical standards research and information service; and
- by acting as the provincial GATT Enquiry Point for technical notifications received from the Standards Council of Canada.

Metric conversion information is supplied and updated through constant liaison with Metric Commission Canada. An ongoing check is also maintained on all sectors of the economy affected by conversion. The information obtained is provided as requested by the public or industry. Normally, the office responds to approximately 50 calls weekly for information of this nature.

To provide standards information, an extensive standards library is maintained, with the most recent version of national and international standards. Capability has been increased to provide, wherever possible, a wide range of technical information in the shortest time possible. Requests for technical information are increasing as the library and its services become better known.

Further technical and conversion information is obtained by the office by its participation in the National Intergovernmental Metric Conversion Committee, the Standards Council of Canada, and as an observer to the American National Metric Council.

As a signatory to the General Agreement on Tariffs and Trade, Canada receives notifications of intended regulatory changes which might pose a

barrier to international trade. These notifications are received through the Standards Council of Canada, who distribute them to concerned parties, including the provinces. In British Columbia, the notifications are received and distributed to concerned ministries by the Metric Conversion and Standards Information Office.

PROJECTS AND ACHIEVEMENTS

The start of the retail foodstore scale conversion program at the beginning of 1982 stimulated a notable increase of public interest in metric conversion.

Much of the increase in telephone enquiries has been made possible through public access to provincial government agent offices and the newly established Canada Service Bureaus.

The media have also become more aware of conversion and the office has been requested to supply background information for several feature articles, and has participated in TV and radio phone-in shows.

In late 1981, the Metric Conversion and Standards Information Office was asked for assistance in providing metric information for the visually impaired. The office, with the assistance of the Crane Library at the University of British Columbia, a private radio station, and the committee of the blind, is now in the process of producing a tape to be distributed throughout the province.

A major boost to the effectiveness of the standards information services provided by the office was the subscription to the processed technological information system, the VSMF (Visual Search Microfilm Files).

THE FUTURE

The retail scales conversion program will continue to demand a high degree of response from the Metric Conversion and Standards Information Office.

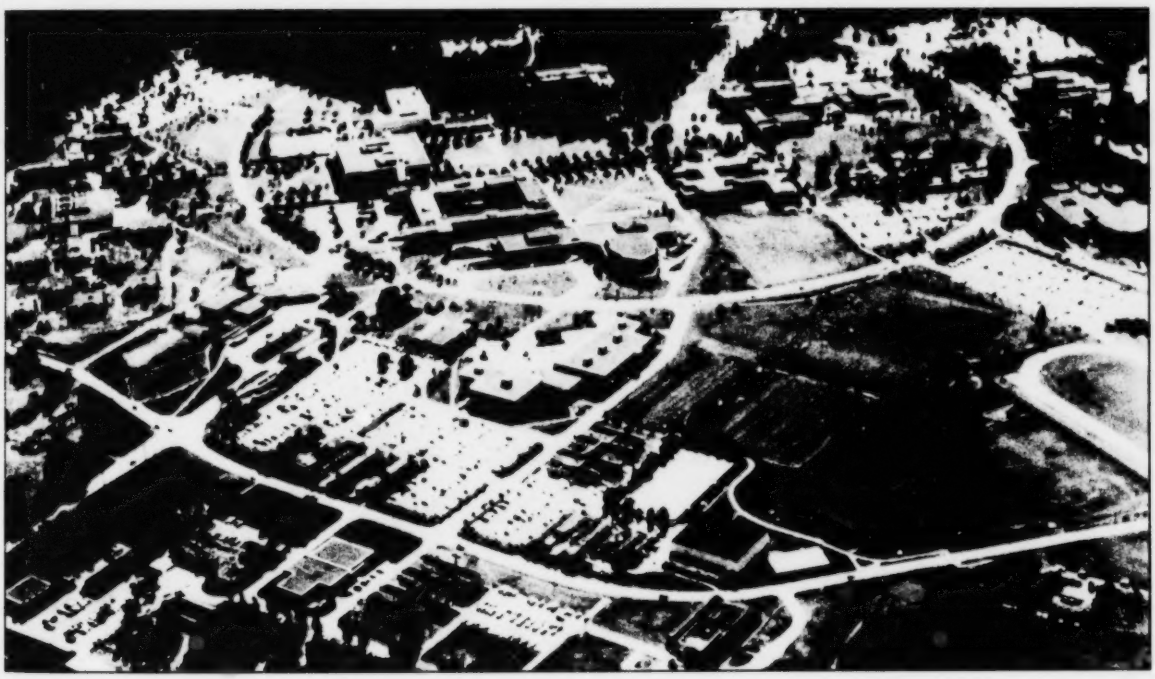
The quantity of standards information available has increased, and will continue to increase, with the acquisition of a complete set of standards from the International Standards Organization. This increased capability, together with the present library, will provide BC industry and government with standards on almost all sectors of the economy.

UNIVERSITIES DIVISION

The Universities Division administers government policy concerning the operation of the province's three public universities; the University of British Columbia, Simon Fraser University, and the University of Victoria. Recent financial data indicate that provincial government grants provide up to 80 per cent of the total income for general operations and for sponsored research activities of the three universities, with most of the provincial grants being awarded through the Ministry of Universities, Science and Communications. Grants provided through the Universities Division totalled approximately $324 million in 1981-82, or 4.9 per cent of the provincial government's total estimated expenditure. This sum includes $271.7 million for general operating purposes, and $19 million in capital support for buildings and renovations. Support was also provided for:

- student financial aid;
- other institutions providing university level courses including the Open Learning Institute and David Thompson University Centre but excluding community colleges;
- the development of university programs in non-metropolitan areas of the province and supporting delivery systems;
- the medical teaching expansion program; and
- the engineering education expansion program.

An aerial view of the University of Victoria. Overall provincial government allocations to the three universities increased 12 per cent in 1981-82.

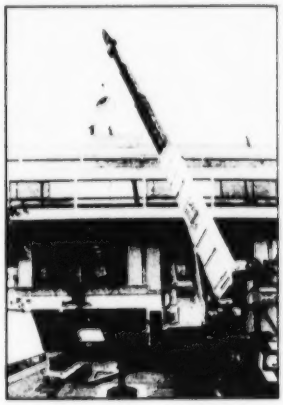


The most recent program delivery method is provided by the Knowledge Network of the West, a non-profit society which establishes television channels for educational delivery via satellite and cablevision. The Knowledge Network of the West Communications Authority (KNOW) provides three educational telecommunications services and co-ordinates program development and support among the educational users of these services. These three services are access to general educational programs on the community cablevision services; closed circuit inter-active programming; and closed circuit inter-institutional systems which will link the universities, teaching hospitals, and other institutions in Greater Vancouver and Victoria.

Funding is also provided for the operation of the Universities Council of British Columbia, which offers advice and support to universities and makes recommendations to government on a wide range of matters including operations, capital budgets, and programs direction for the universities. The council, under the University Act (1979), is responsible for the allocation of general operating grants to the universities.

The division has two senior officials; the Assistant Deputy Minister of Universities, and the Director of University Programs who reports to the ADM. The assistant deputy minister acts as the senior ministry representative on university matters, and interacts at a policy level with the universities, the University Council, and other related agencies regarding university operations and program needs. The ADM also liaises with other provincial and federal ministries and departments to ensure program co-ordination at the university level. The director assists the assistant deputy minister in co-ordinating ministry responsibility for the development and implementation of plans, policies, and programs; by preparing formal reports and recommendations; in managing special projects; and in working with other ministries— especially the Ministry of Education, Post-Secondary Department— and the appropriate post-secondary councils.

The KNOW transmitting disc being hoisted atop the Woodward Instructional Resources Centre at UBC. This building became the operational and production centre for the network in September, 1981.



THE UNIVERSITIES COUNCIL

The Universities Council, appointed by the Lieutenant-Governor-in-Council, is an independent agency providing advice on university affairs through the Minister of Universities, Science and Communications. The council is an independent Crown agency established by authority of the University Act (1979). Its autonomous legal status was established through Order-in-Council in 1978.

There are 11 members, including the chairman, appointed by the Lieutenant-Governor-in-Council. No council member, however, can serve simultaneously as a member of government and as a university faculty or staff member or student, or a public servant in the provincial ministries of Education, Finance, and Universities, Science and Communications. A member's term is for three years, and is renewable once, for a similar period.

The current members of The Universities Council are:

Chairman: WILLIAM C. GIBSON, MD, FRCP, former head of the Department of History of Medicine and Science at UBC, former Vancouver Alderman, and former head of the Kinsmen Laboratory of Neurological Research.

Vice-chairman by election: DAVID A. FREEMAN, BA, QC, partner in the law firm Freeman & Company, and former chairman of the Executive Committee of the British Columbia Research Council.

SAMUEL BELZBERG, B.Comm., Chairman of the board of First City Trust Company, and president of First City Financial Company Ltd., former vice-president of Friends of the University of Alberta.

S. JOSEPH CUNLIFFE, BASc., Hon. LLD, P.Eng., President of the engineering firm Willis, Cunliffe, Tait and Company Ltd., former chairman of the Board of Governors of the University of Victoria, and current chairman of the Board of Directors of the University of Victoria Foundation.

ALAN M. EYRE, BASc., P.Eng., President of Dueck (GM) on Broadway Ltd., and chairman of the Greater Vancouver Advisory Board of the Salvation Army, former member of the UBC Board of Governors and of council's predecessor, the Financial Advisory Board.

RENDINA HAMILTON, BA, LLB, presently a director of BC Telephone Company and of the Registered Nurses' Association, former president of the BC School Trustees Association and former member of the UBC Board of Governors.

GEORGE L. MORFITT, B.Comm., FCA, Executive vice-president of The Diamond Group, and president of the Institute of Chartered Accountants of BC, former West Vancouver Alderman, and former chairman of the UBC Board of Governors.

RAY PARKINSON, BA (HONS.), MD, FRCP, Vancouver psychiatrist in private practice, former MLA and former chairman of the SFU Board of Governors.

G. NEIL PERRY, BA, PhD, retired, economist and educator, former Deputy Minister of Education for BC, former vice-president of UBC, and past director of the school of public administration at UVic.

P.R. (DICK) SANDWELL, BASc., HON. LLD, Chairman of the engineering firm Sandwell & Company Ltd., director of the Royal Bank of Canada, and former member of the Science Council of Canada.

IAN H. STEWART, BA, LLB, currently engaged in the directorship of several companies in the communications field as well as in finance and management, former member of the UVic Board of Governors, and former Victoria Alderman.

The term of the following members expired in December 1981:

RANDOLPH HARDING, former MP and MLA, retired school superintendent, currently mayor of Silverton, BC.

JACK HETHERINGTON, BASc., President of the lumber company Ralph S. Plant Ltd., and former chairman of the government relations committee of the UBC Alumni Association.

FRANKLIN E. WALDEN, BA, B.Comm., CA, retired partner in the accounting firm Clarkson Gordon, former member of the BC Energy Commission, and former president of the UBC Alumni Association.

ROLE AND FUNCTIONS

The Universities Council serves as an intermediary between British Columbia's three public universities and the provincial government. Its purpose is to promote the orderly development of university education and to create public accountability for university expenditures. Some of the council's most important functions are:

- recommending general funding levels for universities;
- allocating the Annual Provincial Operating Grant among the three public British Columbia universities; and
- ensuring that duplication of programs is avoided.

Council's mandate has been extended by the ministry to include responsibility for reviewing and approving the university-level program of the British Columbia Open Learning Institute, academic transfer programs, and capital facilities at David Thompson University Centre in Nelson.

The full council meets on a regular basis once a month. If circumstances warrant, special meetings are arranged. Council traditionally meets in offices at 500-805 West Broadway, Vancouver, but it is empowered to hold public meetings anywhere in the province. Once a year, the council visits the campuses of the three universities to meet with the boards of governors.

Much of the background work for council is performed by the following four standing committees which include university representation at the vice-presidential level:

- the Business Affairs Committee;
- the Capital Planning and Development Committee;
- the Program Co-ordinating Committee; and
- the Long Range Planning Committee.

Task forces and sub-committees are struck, and external consultants engaged as required.

The Business Affairs Committee advises council on financial matters, with emphasis on the budgets of the public universities, and the university programs of the Open Learning Institute. Each August it receives the funding submissions of the universities. From these, the Universities Council prepares its recommendations to the Minister of Universities, Science and Communications for the provincial operating grant to the universities and the Open Learning Institute (university programs) for the following fiscal year. Once the total provincial operating grant for that year is known, council allocates the approved funds to the individual universities with the advice of the Business Affairs Committee.

The Capital Planning and Development Committee reviews matters pertaining to the universities' physical facilities including new capital projects, public works, renovations, and major equipment. Its activities are in part concerned with the BC Educational Institutions Capital Financing Authority Act, which makes it possible to provide long-term debenture financing of capital projects. Since 1980, it has also been possible to debenture finance major equipment acquisitions, but over a 10-year rather than a 20-year period. The committee reviews the need and suitability of projects proposed by the universities, then makes a priority recommendation to council.

The Program Co-ordinating Committee advises the Universities Council on academic programs. It evaluates all new program proposals presented

by the universities according to such criteria as the academic rigor of the curriculum, cost, duplication, and employment opportunities. Both existing and proposed programs are reviewed in order to rationalize the delivery of university-level programs in the province, identifying areas where inter-institutional co-operation would be desirable, and specifying special areas of interest at each university. The committee also helps to co-ordinate the delivery of distance education programs to non-metropolitan areas of British Columbia.

The Long Range Planning Committee is a committee-of-the-whole which includes the presidents of the three universities and the principal of the Open Learning Institute. By way of an annual Outlook Conference, the committee promotes discussion of institutional roles, academic objectives, and long range financial and academic planning. The theme for the 1981 conference was educational quality.

Many of council's activities are performed on an annual, recurring basis as a result of the functions assigned to the council under the University Act. The results of these activities are reported in the following pages of this report. In some instances, however, special developments occurred in these ongoing activities, while other developments were of a non-recurring nature.

In the budgetary process, council separately reviewed the UBC Medical School Expansion budget, as well as the Engineering Education Expansion requirements of all three universities. These examinations were made in conjunction with ministry officials, for the purpose of making recommendations to government for designed funding of these developments begun under government mandate. Additionally, council began a comprehensive examination of the allocation formula by which, in agreement with the universities, it had allocated, for the past three years, the general provincial operating grant.

Academically, council reviewed and reaffirmed its policy respecting Programs of Distinction, by which council, in consultation with the universities, makes funds available to ensure continued academic program development at the institutions. Additionally, council established an ad hoc committee to discuss the library capital requirements of the University of British Columbia.

This year, for the first time, the Universities Council developed and submitted to the ministry a fully integrated five-year capital plan for the university system, listing all projects in priority order. This plan, covering the period 1981-82 to 1986-87, encompasses major buildings, public works, renovations, and equipment for the three universities and related institutions.

At the request of the ministry, council began a review of the University Act to identify sections which may require amendments in order to improve the management of the university system.

Administratively, council implemented a staff reorganization and obtained some office space in Victoria in order to make its working relationship with the ministry and Treasury Board officials more efficient.

OPERATING GRANTS

Operating grants are used to fund ongoing university programs and required support services such as the library, student services, and administration. Except for the special financing arrangements in the capital budget, universities are prohibited by the University Act from incurring a deficit.

Universities may be viewed as performing three inter-related functions: teaching, research, and community service. Primarily concerned with the generation and dissemination of knowledge, the universities are finding it increasingly difficult to defend themselves against erosion caused by rising costs. Thus, tuition fees set by the universities in the order of $800 per full-time student, consistent with 1981-82 fee levels elsewhere in Canada, were able to generate only one-tenth the revenue provided by the government in its annual grant for general operating purposes. Most of the provincial operating funds are devoted to the teaching and community service functions, because significant funding for research purposes can be obtained from other sources.

The operating grants for the universities are influenced by recommendations made by Universities Council. There are two distinct categories of operating grants: the general purpose Operating Grants, and the special purpose Operating Grants (Other). The general purpose operating grant for 1981-82 was $271 712 760, an increase of 12 per cent over the previous year. Once this figure was established by the Legislature, Universities Council allocated this amount among the three universities. The formula used to allocate these funds took into account the size of the institution, and the student enrolment mixture by year and by type of course. The trimester system offered at SFU involved a special allowance in the formula. Although council designated some specific uses for the funds, each university received approximately 97 per cent of its allocation, without restrictions on its autonomy to manage these funds efficiently, taking into account advice from the government and from council.

Allocation of General Purpose Operating Grants to Universities, 1980-81 and 1981-82

University	1980-81	1981-82	Per Cent Change
British Columbia	$143 323 783	$161 781 475	12.9
Simon Fraser	54 317 986	61 324 884	12.9
Victoria	44 979 156	48 606 401	15.8
Total	**$242 620 925**	**$271 712 760**	**12.0**

Source: Universities Council of British Columbia

OPERATING GRANTS (OTHER)

The second category of operating categories, Operating Grants (Other), totalled $22 619 460 in 1981-82. This category consists of a number of specific grants made directly to a variety of organizations for particular purposes designated by the government. The size of the grants may vary greatly from year to year, with the variation being partly explained by developments taking place in the size and use of the general purpose operating grant. The following table shows the Operating Grants (Other) made over the last two years:

University Operating Grants (Other) 1980-81 and 1981-82

	1980-81	1981-82
Engineering Expansion Project	Nil	$1 500 240
University Medical Expansion Projects	$3 000 000	8 247 947[1]
Interior Programs	2 000 000[2]	3 807 100
Open Learning Institute	1 918 443	2 870 700[3]
Knowledge Network of the West	Nil	1 500 000
David Thompson University Centre	400 000	659 000
Western College of Veterinary Medicine	450 000	633 753
BC Forecasting Committee	Nil	6 250
Health Care Teaching Costs	Nil	1 043 946
Vancouver School of Theology	160 488	173 300
Regent College	153 252	165 000
Bluma Tischler Fellowship	Nil	16 000
Western Institute for the Deaf	10 000	8 000
Chinese Scholar Program	Nil	50 000[4]
Library RECON	750 000	810 000
Joint Board of Teacher Education	161 250	175 000
Industrial Education Teacher Training	726 000	785 100
Family Practice and Pharmacy Training	Nil	168 124
	$9 729 433	**$22 619 460**

[1] Medical Expansion Allocation was $2 098 925; transfer to Operating Grants $6 149 022.
[2] Interior Programs: $1 000 000 Operating Grants (Other) and $1 000 000 transferred from Operating Grants.
[3] OLI funds were transferred to Ministry of Education for administration costs at OLI of $1 123 405.
[4] Chinese Scholar $50 000 transferred from capital support.

The largest expenditure was for the Medical Expansion Projects at the University of British Columbia and related teaching hospitals. These grants separately fund the expansion of the Medical School enrolment from 80 new students to 160 students per year. The first-year class is expanded by 20 students each year, and it will take seven years until the expansion is completed and the graduating class is doubled. The effect of this increase in the training of doctors will give British Columbia students opportunities consistent with the number of doctors needed by the province. The 1979-80 class was the first full expansion by 20 students. The 1980-81 class added 20 more to a total first-year class of 120 students. Although the first-year intake remained constant at 120 students, the total enrolment of students increased proportionately.

The government has recognized the need to provide university programs in the non-metropolitan areas of the province as a natural extension of the diversified college system. These services are supplied in three ways:

- through David Thompson University Centre, established in Nelson in 1979. The centre offers both college programs given by Selkirk College and university-level programs offered by the University of Victoria. A new approach to campus programs is offered by the centre, with a wider variety of programs than either institution could offer on the site;
- through special funding provided to universities to run off-campus programs in all of the major interior and coastal communities and in many of the smaller communities; and
- through the Open Learning Institute (OLI). The institute, which started with enrolees in the fall of 1979, increased enrolment to 3200 in 1980-81 and 1981-82. This major growth in enrolment and course development resulted in subsequent increases in funds to OLI.

Grants were provided to a number of institutions to supply unique programming. These were made:

- to the affiliated theological colleges, Regent College and the Vancouver School of Theology for post-graduate instruction;
- to the Western College of Veterinary Medicine in Saskatoon to train British Columbia veterinary students in the only program in Western Canada;
- to the Joint Board of Teacher Education to support its activity of providing recommendations to all parties included for pre-service and in-service training for public school teachers; and
- for Library Retrospective Conversion of the card catalogues to computer-based microfiche records. This is a project of restrospective conversion of library card catalogues to a computer-accessible format. All new library books are catalogued in a machine-readable and accessible form. This project converts the cataloguing of all previously required holdings to the same format. The system, when completed, will enable all library users in the provincial post-secondary libraries to determine the holdings at any of the libraries. Because the university library holdings are extensive and complex, the process will take at least six years to complete.

Funds were also provided to the Industrial Arts Teacher Training Centre, and the Western Institute for the Deaf.

The development of appropriately trained industrial arts teachers for the high schools of this province is an activity of the Faculty of Education at the University of British Columbia. Both regular students and journeyman tradesmen enrol in these programs. At a special centre located on the BCIT campus — the Industrial Arts Teacher Training Centre — the provincial government, through grants to the university, has sponsored the accelerated portion of the program for the journeyman tradesmen.

By taking a program over an extended winter and summer session, tradesmen qualify to teach in the schools with only one year out of the labour force. They can then complete their training and degree requirements through an internship and further programs on a part-time basis.

The increased provincial expenditure on universities cannot be explained solely by inflationary pressures. Rather, an increasing number of specialized programs are being provided to an increasing number of students. At a time when many jurisdictions in North America were planning for either static or declining enrolments, British Columbia experienced a four per cent increase in full-time equivalent (FTE) university enrolments over the previous year; i.e., from 39 501 FTE in 1980-81 to 41 097 FTE in 1981-82. Similarly, winter session headcounts increased from 45 931 students to 48 023 students. Approximately five per cent of all individuals in BC aged 18-44 living in the region of a university registered in at least one credit course at a university in the past year. In addition, the following table shows the large number of course registrations in non-credit, continuing education courses of various duration. The fee structure for continuing education courses differs from that of credit courses in that the goal is to recover the direct costs of instruction, excluding overhead.

Fiscal Year Full-time Equivalent Enrolments at British Columbia Universities

	UBC	SFU	UVic	FTE Totals	
1978-79				System	%
Undergraduate	19 952	7 624	6 045	33 621	88.9
Graduate	2 990	771	448	4 208	11.1
	22 942	**8 395**	**6 493**	**37 829**	**100%**
1979-80					
Undergraduate	19 836	7 521	6 384	33 741	88.0
Graduate	3 256	843	507	4 614	12.0
	23 092	**8 364**	**6 891**	**38 355**	**100%**
1980-81					
Undergraduate	19 937	8 012	6 607	34 555	87.5
Graduate	3 470	886	594	4 946	12.5
	23 407	**8 898**	**7 201**	**39 501**	**100%**
1981-82					
Undergraduate	20 207	8 377	7 286	35 870	87.3
Graduate	3 644	951	632	5 227	12.7
	23 851	**9 328**	**7 918**	**41 097**	**100%**

Enrolment viewed in terms of winter session headcount (the number of part-time and full-time students enrolled) is as follows:

	1978-79	1979-80	1980-81	1981-82
UBC	25 355	25 697	26 179	26 651
SFU	9 702	9 780	10 874	11 424
UVic	7 746	8 362	8 878	9 948
	42 803	**43 839**	**45 931**	**48 023**

Source: Universities Council of British Columbia

Continuing Education, Non-Credit Course Registrations 1980-81

UBC	Centre for Continuing Education, Professional Continuing Education in Health Sciences, Social Work, Agriculture, Forestry, and Education		81 688
SFU	On- and off-campus	16 582	
	Downtown (estimate)	2 000	18 582
UVic	On-campus	7 944	
	Off-campus	9 813	17 757
Total			**118 027**

GRANTS— CAPITAL SUPPORT PROGRAMS

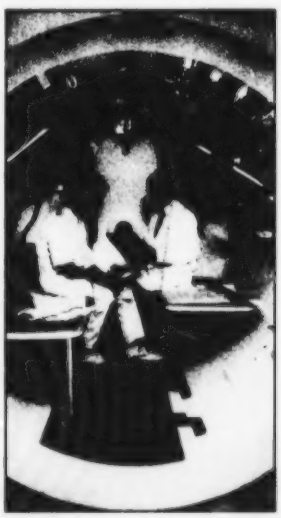
The Capital Support Program covers three main areas:

- construction of new buildings and other facilities;
- maintenance work and improvements to existing facilities (referred to as renovations and public works projects); and
- purchase of major equipment items.

For capital equipment purchases, the ministry provides cash grants and debentured financing to each university. In 1981-82, cash grants totalled $3 million. During this same period, debenture financing was made available for the purchase of major equipment items totalling $5 million. The cash grants and debentured equipment funds were allocated according to recommendations from Universities Council.

	1980-81 Estimates (Cash Grant)	1981-82 Estimates (Cash Grant)	1981-82 Debenture Equipment Borrowing Authority
UBC	$1 836 000	$1 920 000	$3 500 000
SFU	650 000	600 000	750 000
UVic	514 000	480 000	750 000
Total	**$3 000 000**	**$3 000 000**	**$5 000 000**

This hypo-hyperbaric chamber at SFU will allow the Kinesiology Department to simulate pressures up to 12 200 metres above and 300 metres below sea level. The facility was made possible through the Capital Support Programs.



Renovations and public works approvals to the three universities for the period April 1, 1981 to March 31, 1982, totalled $11 881 000. These funds were allocated as follows:

UBC	$ 6 400 000
SFU	3 596 000
UVic	1 885 000
Total	**$11 881 000**

A major portion of the Capital Support Program is devoted to the construction of new facilities. The beginning of the capital process is the five-year plan. Once a year, each university submits its updated five-year plan to the Universities Council. The council then forwards a consolidated five-year plan to the ministry. The five-year plan is a planning strategy, with projects receiving formal approval on a project-by-project basis. After the council submits its recommendations on specific projects to the minister, most projects pass through a two-stage approval process within the ministry and Treasury Board. At the first stage, a project is approved in principle, complete with a total estimated cost for the project. In addition, funding is authorized for the first six per cent of the project's cost. This pre-construction approval funds such activities as preliminary and final architectural plans up to the tender documents. At the second stage, the final 94 per cent of the funding is approved for building construction and site services.

During the twelve-month period covered by this report, the following projects estimated to cost $19 700 000 have passed through at least the first of the two steps outlined above:

Institution	Project	Estimated Cost
UBC	Physical Plant I	$ 6 500 000
	Laurel II	2 900 000
SFU	West Mall	10 000 000
UVic	CBC Building	300 000

During the same 12-month period, activities on buildings worth $39 686 735 have been carried out, in addition to the $11 881 000 listed above for public works and renovations.

All costs incurred for building activities, public works, and renovations are financed through a two-stage debt-servicing procedure. When costs are first incurred, they are covered by temporary loans received by the universities through their banks. Once the temporary bank loans reach a sufficiently high level for a project — determined by the ministry — they are converted into long-term debentures. Through this process, the Educational Institution Capital Finance Authority loans the institution funds to pay the temporary bank loan. In return, the university issues a debenture to the Authority, by which the university undertakes to repay the loan according to a specified schedule. The ministry provides funds to the university to meet the repayment schedule. There are two interest payments plus one principal payment each year, and the debentures carry a 20-year term.

The advantage of the debenture procedure is that it enables the government to meet the immediate needs of the universities, without creating an immediate drain on the province's cash flow. Since the current capital approval and financing procedures were adopted in 1977, projects worth $216 083 675 have been approved. Against this approval amount, borrowings to date equal $140 034 641. Servicing this debt cost over $16 million in fiscal 1981-82.

STUDENT AID PROGRAMS

Student aid programs are designed to ease the financial burden of those wishing to pursue post-secondary objectives. These programs are administered by the Institute Support Services of the Ministry of Education and funded by the Ministry of Universities, Science and Communications.

BRITISH COLUMBIA STUDENT ASSISTANT PROGRAM

The Student Assistance Program is a comprehensive program of financial aid for post-secondary students. Its purpose is to ensure that residents of British Columbia are not prevented from reaching their educational goals because of financial limitations.

Although the principal responsibility for meeting educational costs must remain with the student, this program exists to supplement the student's financial resources when funds otherwise available are insufficient to cover estimated expenses. A standard needs assessment procedure established by the federal and provincial governments determines the level of assistance for each student based on the number of weeks of study.

The Student Assistance Program is composed of two inter-related components: the Canada Student Loan Program, and the Special Assistance Program.

Canada Student Loan Program

Funded by the federal government and provincially administered, the program allows for a repayable loan of $56.25 per week for a single person, or $75.00 per week for married couples, up to a maximum of $2400 per education year, the amount being subject to change.

Funds are normally disbursed in a combination of non-repayable provincial grant and repayable federal loan. Eligibility for the grant may, however, be limited by factors such as program of study, educational institution, and ownership of assets.

Special Assistance Program

The Special Assistance Program is designed to provide financial assistance to students attending post-secondary studies on a part-time or short-term basis and who do not, therefore, qualify under the regular BC Student Assistance Program.

British Columbia residents demonstrating financial need while enrolled in less than 60 per cent of a full course load or in programs less than 12 weeks duration may qualify for Special Assistance Program funds, provided their course of study leads to a certificate, diploma, or first degree.

Normally, program assistance is aimed at mature or single parent students attempting to upgrade marketable skills; however, students receiving aid from other government sources, such as the Ministry of Human Resources, are also considered.

A maximum of $300 in non-repayable grant funds is available per academic year to qualified students on the basis of need.

Comparative Award Statistics for the 1980-81 and 1981-82 Program Years[1]

BCASP Grants[2]	1980-81	1981-82	Per Cent Change
In-Province			
Number	12 302	12 633	2.7
Amount	$11 096 231	$13 399 813	20.8
Average Grant	$ 902	$ 1 069	18.5
Out-of-Province			
Number	675	799	18.4
Amount	$ 868 988	$ 1 131 555	30.2
Average Grant	$ 1 287	$ 1 445	12.3
Total Grants Authorized			
Number	12 977	13 432	3.5
Amount	$11 965 219	$14 531 368	21.5
Average Grant	$ 922	$ 1 090	18.2
Canada Student Loan[2]			
In-Province			
Number	14 293	14 944	4.6
Amount	$18 996 168	$21 926 726	15.4
Average Loan	$ 1 329	$ 1 424	7.2
Out-of-Province			
Number	2 111	2 513	19.0
Amount	$ 3 247 066	$ 4 239 979	30.6
Average Loan	$ 1 538	$ 1 689	9.8
Total Loans Authorized			
Number	16 404	17 457	6.4
Amount	$22 243 234	$26 166 705	17.6
Average Loan	$ 1 356	$ 1 505	10.9

[1] Projected

[2] Represents the number and amount of grant and loan confirmation which are issued, rather than the awards actually disbursed.

THE WORK-STUDY PROGRAM

The Work-Study Program, initiated in 1977, is designed to provide on-campus work experience for students requiring financial assistance while attending a post-secondary institution.

A limited number of part-time on-campus jobs, averaging five to 15 hours per week, may be made available to post-secondary students.

The program is open to British Columbia residents studying at participating universities, colleges, and institutes located in British Columbia.

Students demonstrating a financial need, under the terms of the Student Assistance Program, are considered for the Work-Study Program.

The Work-Study Program was established to:

- aid students in reducing indebtedness incurred while pursuing a post-secondary program of study;
- assist students in meeting additional educational costs that are not usually covered by the BC Student Assistance Program;
- assist in the absence of student saving or parental/family contributions; and
- where possible, provide students with career-related job experience.

Since the number of positions is limited, institutions are under no obligation to guarantee placement. Jobs made available through the Work-Study Program will be administered by the institutions, according to their internal policies and procedures.

LIST OF PERSONNEL

MINISTER'S OFFICE
P.L. McGeer, Minister
I.J. Burnes, Policy Co-ordinator
L.E. Harder, Secretary to the Minister
K.L. Henry, Clerk

MINISTRY ADMINISTRATION
R.W. Stewart, Deputy Minister
T.P. Russell, Secretary
N.N. Aleksenko, Director, Finance and Administration
D.Y.M. Hurst, Secretary
D.L. Cook, Manager, Financial Services
R.C. Joyce, Manager, Personnel Services
J.S. Powell, Supervisor, Financial Operations
A.M. Goldade, Co-ordinator, Administrative and Pay Services
L.K. McIntosh, Accounts Payable Clerk
V. Hoyt, Receptionist

AUXILIARY EMPLOYEES
G.E. McFie, Personnel Technician
C.D. Arnold, Accounts Receivable Clerk

UNIVERSITIES DIVISION
A.E. Soles, ADM, Universities
M. Freeman, Secretary
D.S. Goard, Director, University Programs
C. McDonald, Administrative Support/Secretary

SCIENCE AND TECHNOLOGY DIVISION
B.W. Stevenson, Director

METRIC CONVERSION AND STANDARDS
E. Gosh, Executive Director
E.A. Sheridan, Secretary
F.A. Vitek, Technical Co-ordinator
P.J. Wall, Public Information Co-ordinator
M.A. Tweedie, Assistant Technical Co-ordinator
L. Wahl, Office Support

COMMUNICATIONS DIVISION
H.J. Page, ADM, Communications
B.J. West, Secretary

TELECOMMUNICATIONS SERVICES

ADMINISTRATION
R.N. Mussenden, Director
I.D. Davis, Secretary

COMMON CARRIERS
G.H. Stock, Assistant Director
W.F. Krogel, Manager, Planning and Administration
G.A. Bennett, Facilities Manager
S.S. Davidson, Telecommunications Systems Analyst
A.L. Wade, Telecommunications Systems Analyst
M.J. Hilton, Telecommunications Systems Analyst
D.W. Smith, Telecommunications Systems Analyst
D.H. Nelson, Telecommunications Systems Analyst
E.B. Wickens, Clerk
R.E. Brown, Toll Investigations Clerk
C.J. Fetterly, Directories Clerk
D.M. Robinson, Billing Clerk
M.L. Witzer, Accounts Clerk
L. Keir, Order Typist
C. Ribeiro, Order Typist

AUXILIARY EMPLOYEES
F. Ball, Clerk

SWITCHBOARD OFFICE, VANCOUVER
F.E. Taylor, Supervisor, Switchboard Operations
M.A. Page, Switchboard Operator
M.M. Coatta, Switchboard Operator
J. Carrigan, Switchboard Operator
D.J. Gracey, Switchboard Operator
E.A. Kilback, Switchboard Operator
M.A. Manahan, Switchboard Operator
G. Engbrecht, Switchboard Operator
R. Danchuk, Switchboard Operator
N.J. Dobbie, Switchboard Operator
G.R. Tychynski, Switchboard Operator
M.E. Lang, Switchboard Operator
J.C. Tetlock, Switchboard Operator
C. Blake, Switchboard Operator
P. Hundley, Switchboard Operator

AUXILIARY EMPLOYEES
A. Fleming, Switchboard Operator
V. Marsh, Switchboard Operator
S. Mason, Switchboard Operator
M.N. Hawkins, Switchboard Operator
D.N. Foley, Switchboard Operator
C. Carp, Switchboard Operator
P. Humphreys, Switchboard Operator
E. Cryan, Switchboard Operator
J. Nolan, Switchboard Operator
S.M. Rudy, Switchboard Operator
B. Parsons, Switchboard Operator

SWITCHBOARD OFFICE, KAMLOOPS
L.L. Beeson, Supervisor
E. Dafoe, Switchboard Operator
J.E. Carson, Switchboard Operator

AUXILIARY EMPLOYEES
M.M. Heslop, Switchboard Operator
P.E. White, Switchboard Operator

SWITCHBOARD OFFICE, PRINCE GEORGE
S.C. Adam, Supervisor
W.G. Ryan, Switchboard Operator
J.B. Hilmo, Switchboard Operator

AUXILIARY EMPLOYEES
E. Lamoureux, Switchboard Operator
H.W. Bunton, Switchboard Operator
L. Spencer, Switchboard Operator
H. Blackstock, Switchboard Operator

SWITCHBOARD OFFICE, VICTORIA
M.N. Russell, Supervisor, Switchboard Operations
J.E. Von Schalburg, Switchboard Operator 4
A.L. Bent, Switchboard Operator 3

P.M. Strickland, Switchboard Operator 3
M. Stewart, Switchboard Operator
V.J. Sargent, Switchboard Operator
J. Deen, Switchboard Operator
A. Locke, Switchboard Operator
M.A. Workman, Switchboard Operator
M.R. Donaldson, Switchboard Operator
D.A. Gawalko, Switchboard Operator
[illegible] Carswell, Switchboard Operator
[illegible] L. Bamford, Switchboard Operator
A.N. Robertson, Switchboard Operator
P. Ferguson, Switchboard Operator

AUXILIARY EMPLOYEES
C.R. Danroth, Switchboard Operator
E.I. Clarke, Switchboard Operator
C.M. Forgie, Switchboard Operator
E.D. Morrison, Switchboard Operator
D.M. Driedger, Switchboard Operator
V.M. Vacheresse, Switchboard Operator
C. Fontaine, Switchboard Operator
L. Dick, Switchboard Operator
M. Allard, Switchboard Operator
J.D. Alexander, Switchboard Operator
T.J. McConachie, Switchboard Operator
M. Nichol, Switchboard Operator
S. Ditchburn, Switchboard Operator
C. Penner, Switchboard Operator
G. Strycker, Switchboard Operator

MESSAGE CENTRE
B.M. Hutchinson, Supervisor
R.E. Siren, Clerk
L. Gray, Clerk

AUXILIARY EMPLOYEES
B.I. McDougall, Clerk

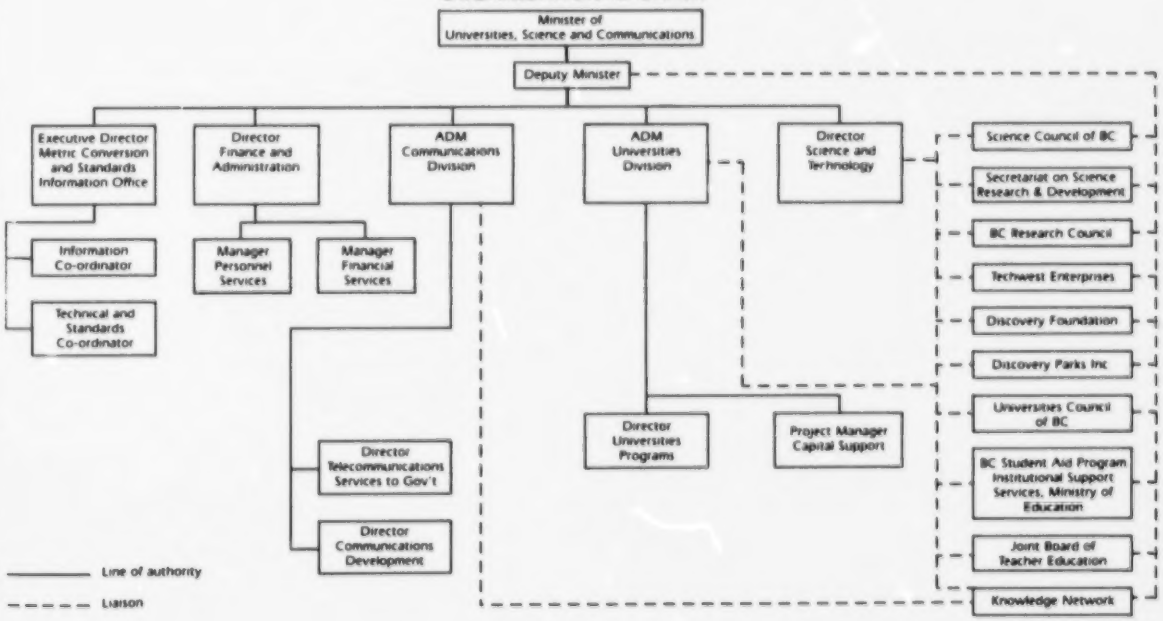
TECHNICAL SERVICES
R.P. Moline, Assistant Director
J.E. Hartley, Design Engineer
D.R. Hawkins, Maintenance Manager
J.F. Gardner, Communications Technician
P.G.J.L. Giesen, Telecommunications Technician
J.R. Duncan, Special Projects Co-ordinator
K. Sherwood, Clerk

COMMUNICATIONS DEVELOPMENT
T.A. Prentice, Director
I.M.L. Edwards, Secretary to Director
S. Burton, Clerk
E.M. Byrnes, Manager, Technology Applications
P.J.A. Hunter, Engineer
J.A. Whybrow, Economic Advisor
L.R. Allen, Policy Advisor
P.N. Templeman, Manager of Policy
P.L. Gardner, Manager, Corporate Relations
D. Slaco, Policy Advisor

AUXILIARY EMPLOYEE
L. Weberg, Clerk

MINISTRY OF UNIVERSITIES, SCIENCE AND COMMUNICATIONS

ORGANIZATIONAL CHART



Queen's Printer for British Columbia ©
Victoria, 1983